CHAPTER 8
TRANSMISSION (4X4)

SPECIFICATIONS 8.4
TORQUE SPECIFICATIONS 8.4
SPECIAL TOOLS 8.4
LUBRICATION 8.4
SHIFT LEVER 8.4
REMOVAL / INSTALLATION 8.4
SHIFT CABLE 8.5
INSPECTION / ADJUSTMENT 8.5
TRANSMISSION SERVICE 8.6
GENERAL OPERATION 8.6
TRANSMISSION REMOVAL 8.7
TRANSMISSION DISASSEMBLY 8.11
SNORKEL / OUTPUT GEAR BACKLASH PROCEDURE 8.16
TRANSMISSION ASSEMBLY 8.18
TRANSMISSION INSTALLATION 8.23
TROUBLESHOOTING 8.25
TRANSMISSION EXPLODED VIEW (2011) 8.26
TRANSMISSION EXPLODED VIEW (2012) 8.28

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

SPECIFICATIONS

Torque Specifications

ITEM	TORQUE VALUE
Bell Crank Nut	12-18 ft. lbs. (16-24 Nm)
Case Bolts	25-30 ft. lbs. (34-41 Nm)
Differential Cover Assembly Bolts	23-27 ft. lbs. (31-37 Nm)
Differential Solenoid	23-27 ft. lbs. (31-37 Nm)
Drain / Fill Plug	10-14 ft. lbs. (14-19 Nm)
Gear Sector Cover	8-12 ft. lbs. (11-16 Nm)
Oil Deflector Shield Screws	20-30 in. lbs. (2.3-3.4 Nm)
Output Gear Assembly Retaining Screws	8-12 ft. lbs. (11-16 Nm)
Park Brake Disc Mounting Bolt	10-15 ft. lbs. (14-20 Nm)
Snorkel Tube Locking Screw	8-12 ft. lbs. (11-16 Nm)
Shift Fork Retaining Screws	8-12 ft. lbs. (11-16 Nm)
Transmission Mounting Bolts Front 5/16” Bolts	20 ft. lbs. (27 Nm)
Transmission Mounting Bolts Lower / Rear 3/8” Bolts	37 ft. lbs. (50 Nm)
Vehicle Speed Sensor Bolt	8-12 ft. lbs. (11-16 Nm)

Special Tools

PART NUMBER	TOOL DESCRIPTION
PA-50231	Snorkel Tool
2871698 (Part of 2871702 Kit)	Rear Output Seal Driver
2871699 (Part of 2871702 Kit)	Rear Driveshaft Seal Guide
2871282	Bearing Seal Driver (50 mm)

SPX Corp: 1-800-328-6657 or http://polaris.spx.com/

Lubrication

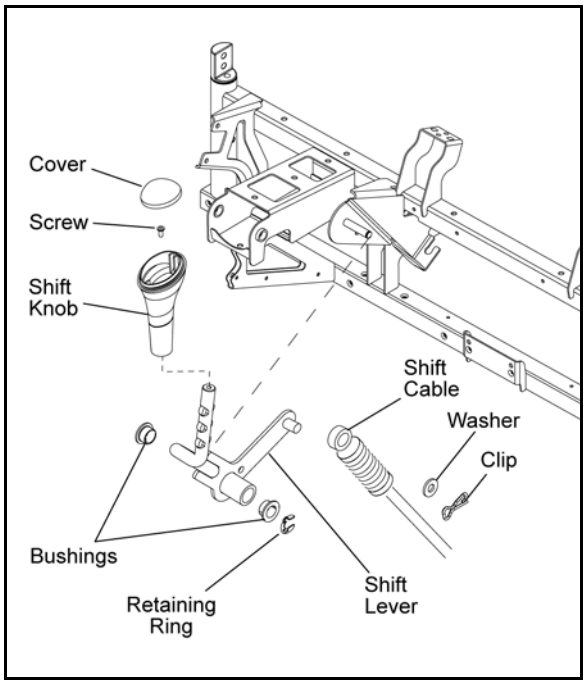
Recommended Transmission Lubricant:
AGL Plus (PN 2878068) (Quart)

Capacity: 33.8 oz. (1000 ml)

SHIFT LEVER

Removal

1. Remove the (2) push rivets retaining the dash panel and remove the panel from the dash to access the shift lever.
2. Remove the shift knob cover, retaining screw and shift knob from the shift lever.



3. Remove grommet around shift lever from the dash.
4. Remove clip and washer retaining the shift cable to the shift lever. Disconnect cable end from the lever.
5. Remove the retaining ring, outer washer, and both bushings from the shift lever.
6. Slide the shift lever off the mounting bracket and out from the frame.

Installation

1. Repeat the steps in reverse order to install the gear shift lever.

© Copyright 2011 Polaris Sales Inc.

SHIFT CABLE

Inspection

Shift cable adjustment is necessary when symptoms include:

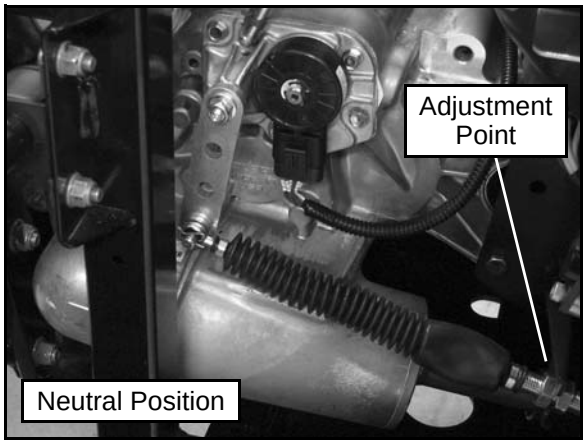
- Noise on deceleration
- Inability to engage a gear
- Excessive gear lash (noise)
- Gear selector is moving out of desired range

Inspect shift cable, clevis pins, and pivot bushings and replace if worn or damaged.

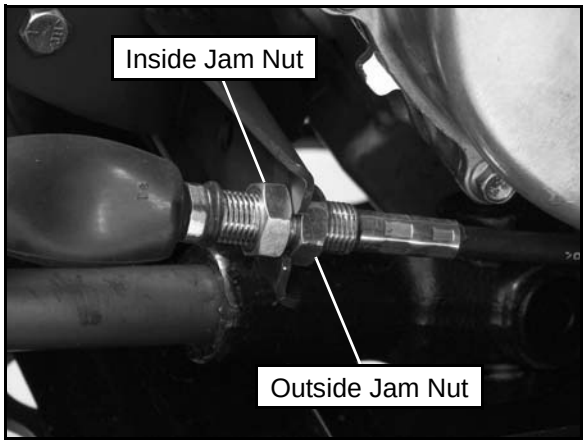
Adjustment

NOTE: The shift cable should be adjusted at the rear adjustment point located near the transmission. If adjustment is needed beyond that, remove the dash panel to access the shift cable adjustment point located underneath the shift lever.

1. Place gear selector in neutral. Make sure the transmission bell crank is engaged in the neutral position detents.



2. Locate the shift cable adjustment point at the engine-to-transmission mount bracket.
3. With two open-end wrenches, loosen the outside jam nut counterclockwise. Turn the outside jam nut 1 1/2 turns.



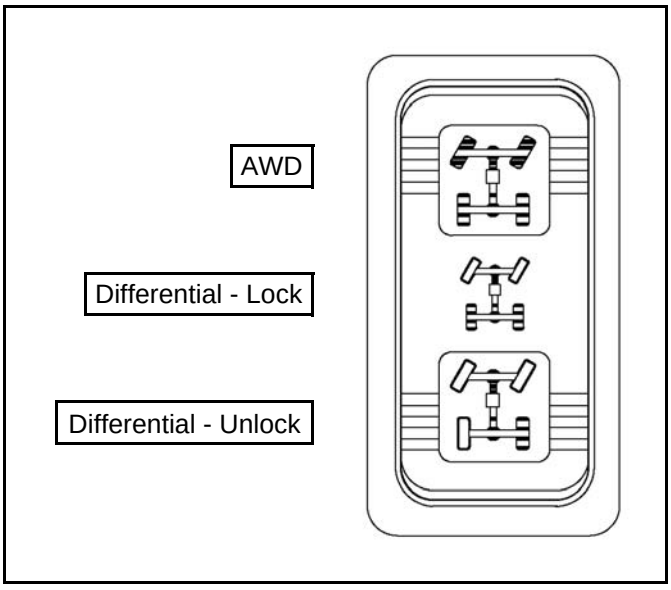
4. After turning the outside jam nut 1 1/2 turns. Hold the outside jam nut with a wrench and tighten the inside jam nut clockwise, until it is tight against the bracket.
5. Repeat Step 3 and Step 4 until the proper adjustment is made to the shift cable.
6. Use this procedure to loosen or tighten the shift linkage cable as needed.

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

TRANSMISSION SERVICE

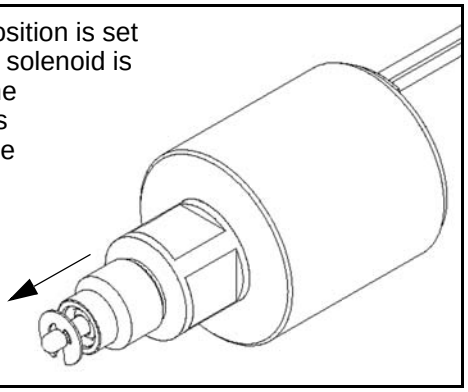
General Operation

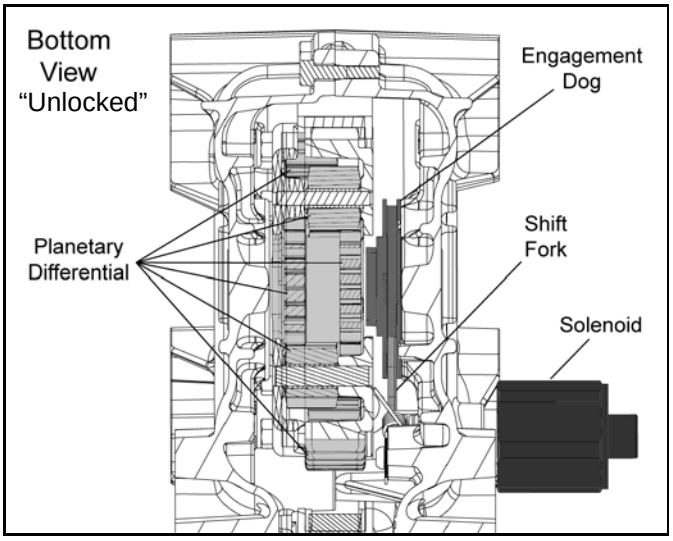
The *RANGER* 4x4 transmission has two traction operational modes: Differential Lock and Differential Unlock. Locking the rear differential is beneficial in low traction and rough terrain conditions. Unlocking the rear differential makes maneuvering easier and minimizes damage to turf and sensitive terrains.



When “Differential-Unlock” is selected on the switch, the rear differential becomes unlocked for tighter turns. An electrical solenoid mounted in the rear portion of the transmission actuates the shift fork. The solenoid plunger extends out to move the shift fork and slides the engagement dog away from the side gear that is part of the planetary differential assembly. This unlocks the rear differential. The rear drive shafts are now dependent on the differential allowing for tighter turns.

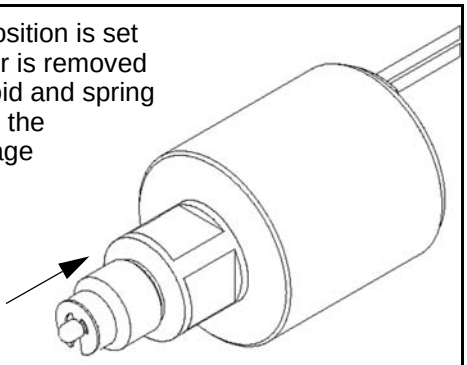
When switch position is set to “Unlock”, the solenoid is powered and the plunger extends to disengage the clutch gear and unlock the differential.

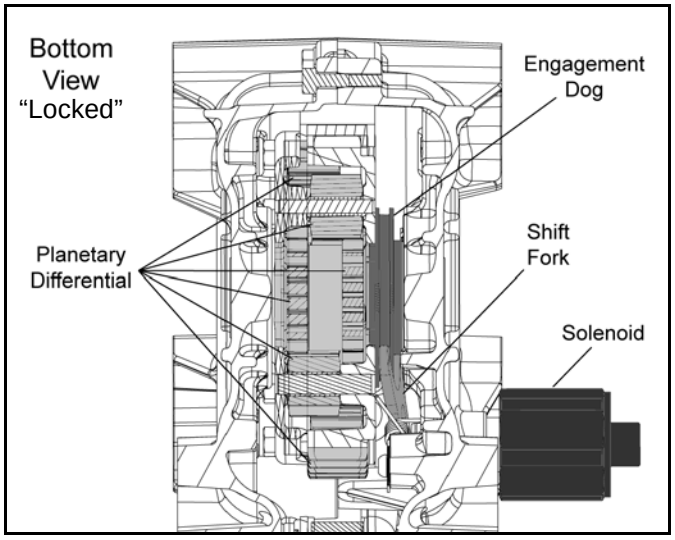




When “Differential-Lock” is selected on the switch, power is removed from the electrical solenoid allowing the solenoid plunger to retract. Spring tension moves the shift fork back into place and engages the engagement dog to the side gear that is part of the planetary differential assembly. This locks the rear differential as a solid rear axle, increasing traction.

When switch position is set to “Lock”, power is removed from the solenoid and spring tension retracts the plunger to engage the clutch gear and lock the differential.





© Copyright 2011 Polaris Sales Inc.

Transmission Removal

1. Place vehicle on a level surface and block the front wheels.

2. Elevate the rear of the vehicle and safely support the vehicle under the rear frame area.

> **⚠ CAUTION**
>
> Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this procedure. Always wear eye protection.

3. Remove the wheel nuts and washers from both rear wheels. Remove the rear wheels and set them off to the side.

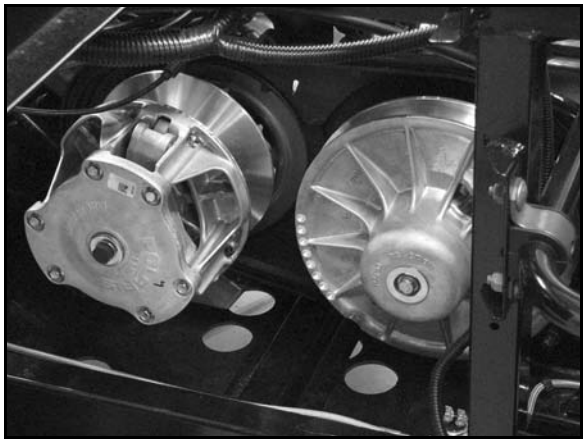
4. If internal transmission repair is required, drain the transmission lubricant.

5. Remove the seat and side storage container to access the PVT system.

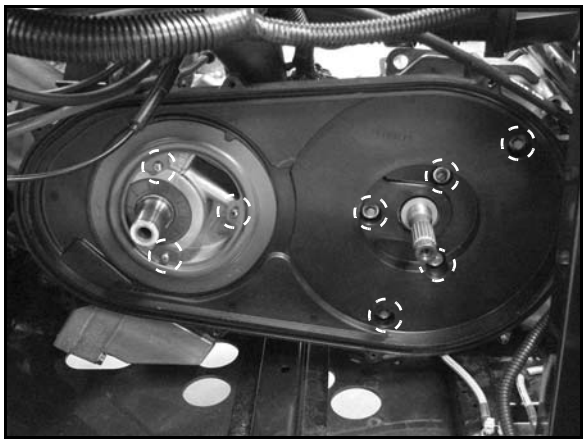
6. Disconnect the brake switch harness located below the outer PVT cover.

7. Using a 3/8” socket, extension and ratchet, remove the (9) screws retaining the outer PVT cover. Remove the cover from the vehicle.

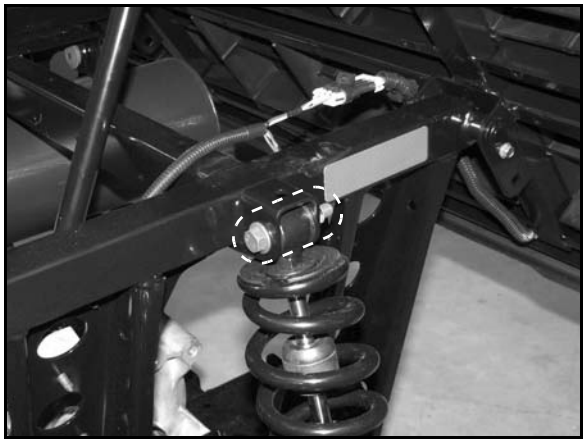
8. Remove the drive belt, drive clutch and driven clutch (see Chapter 6 “Clutching”).



9. Using a Phillips screwdriver, remove the (3) screws retaining the inner PVT cover to the engine. Using a 3/8” socket and ratchet, remove the (5) screws retaining the inner PVT cover to the transmission and remove the cover.



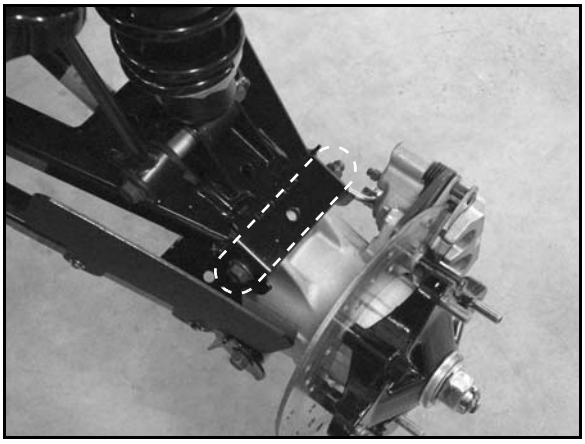
10. Using a 15mm socket, ratchet and wrench, remove the upper fastener from the rear shock on each side.



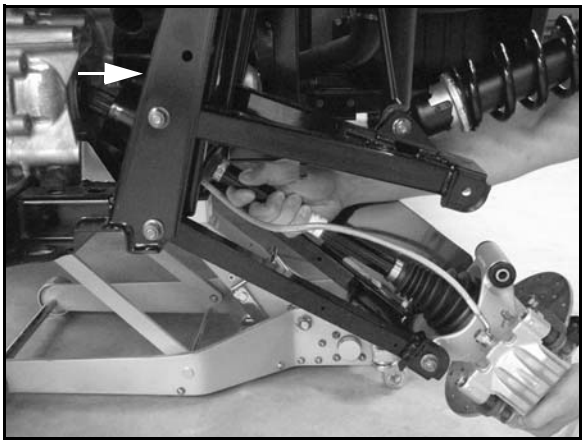
11. Remove the rear brake lines from the rear upper A-arm retainers.

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

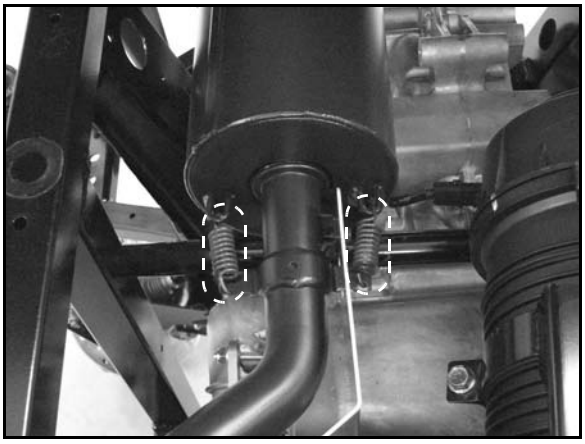
12. Using a 15mm socket, ratchet and wrench, remove the through-bolt retaining the rear upper A-arm to the bearing carrier on each side.



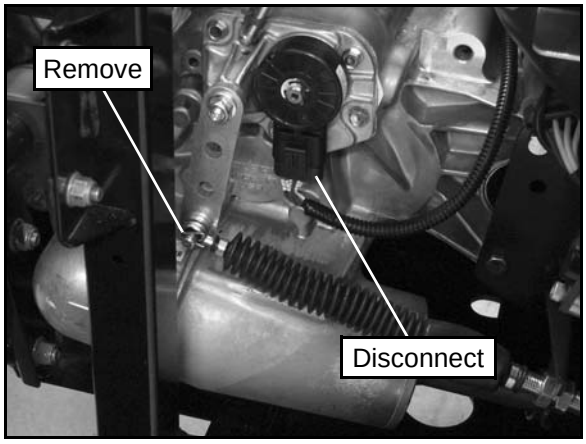
13. Remove the rear drive shafts from each side of the transmission by pulling out sharply on each shaft.



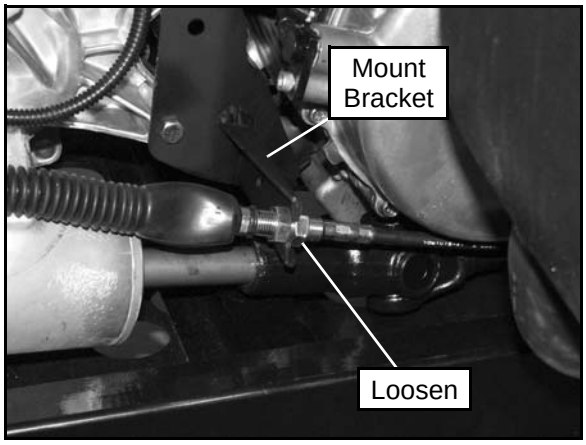
14. Remove the exhaust springs retaining the exhaust silencer and remove the silencer from the vehicle.



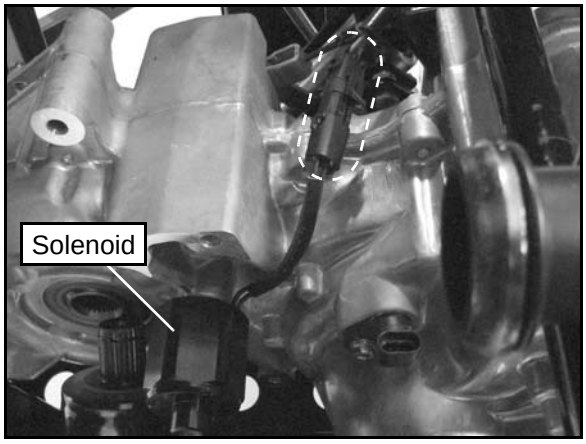
15. Remove the shift cable from the transmission bell crank and disconnect the gear selector switch.



16. Using a 3/4” open-end wrench, loosen the lower jam nut on the shift cable and remove the shift cable from the mount bracket.



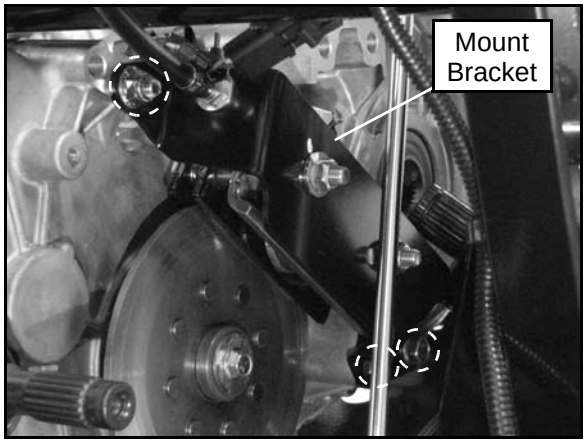
17. Disconnect the rear differential solenoid.



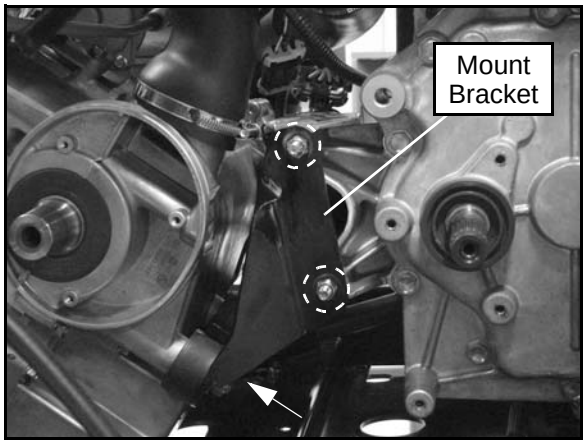
18. Disconnect the vehicle harness from the vehicle speed sensor located on the right-hand side of the transmission.

© Copyright 2011 Polaris Sales Inc.

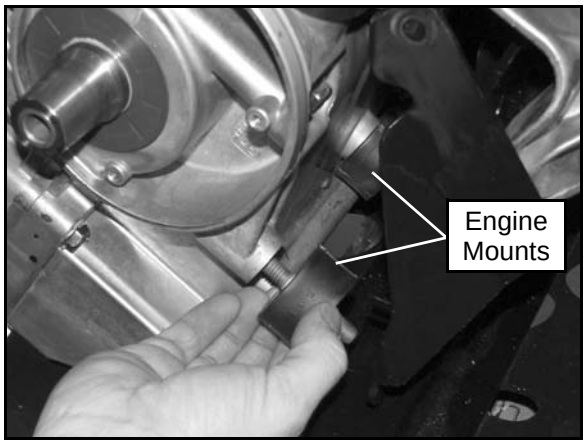
19. Remove the (3) fasteners retaining the parking brake mount bracket and remove the parking brake caliper as an assembly.



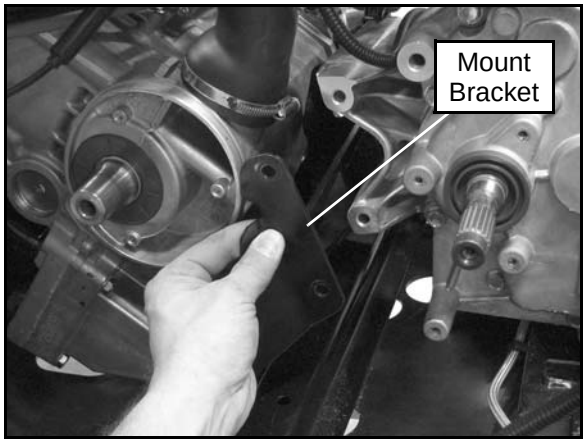
20. Remove the (2) through-bolts and (2) lower engine mount nuts from the engine-to-transmission mount bracket.



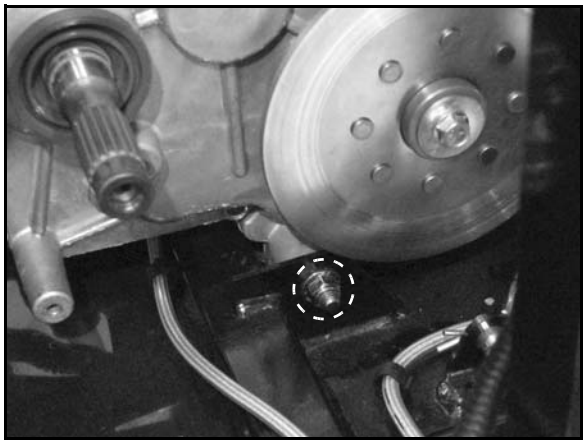
21. Remove the (2) rubber engine mounts from the engine.



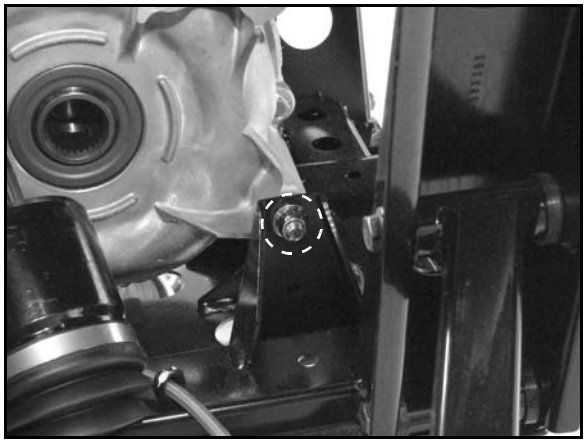
22. Remove the engine-to-transmission mount bracket from the vehicle.



23. Remove the lower transmission through-bolt.

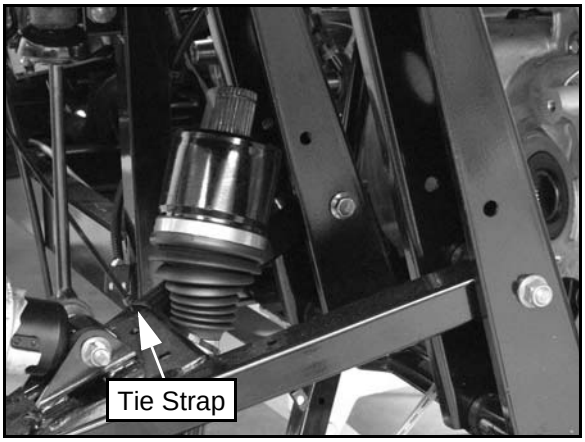


24. Remove the rear transmission through-bolt.

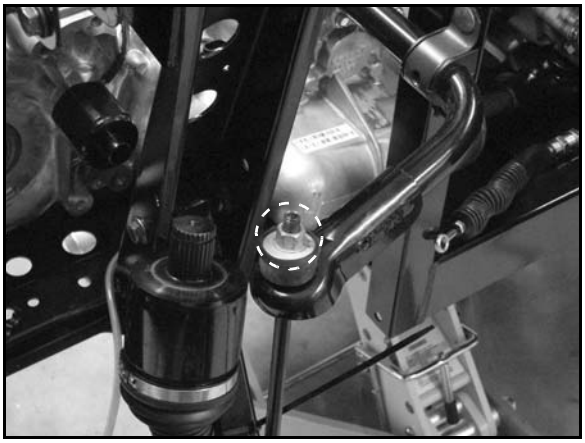


9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

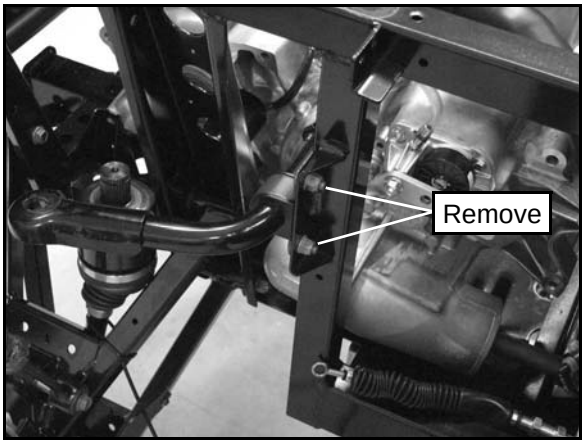
25. Retain each rear drive shaft to the lower A-arm to keep them out of the way during transmission removal.



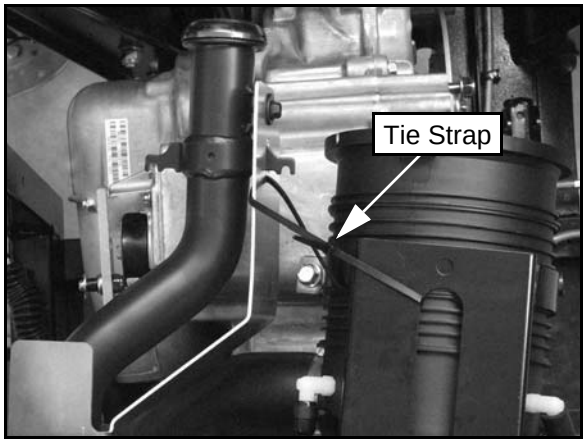
26. Using a 15mm socket and ratchet, remove the retaining nut from the upper portion of the stabilizer bar linkage bushing on each side of the vehicle.



27. Using a 1/2” socket and ratchet, remove the two fasteners that secure the stabilizer bar to the main frame on each side. Remove the stabilizer bar from the vehicle.



28. Tie the exhaust pipe to the airbox to hold it up during transmission removal. Remove airbox lid and air filter.

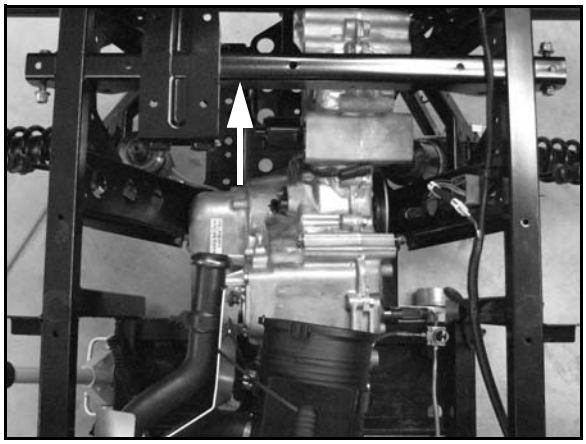


29. Remove lower clip and pin from the cargo box shock. Tie the shock out of the way or completely remove it.

30. *With the help of an assistant,* lift up on the transmission and shift it over to the side to clear the vertical frame support.

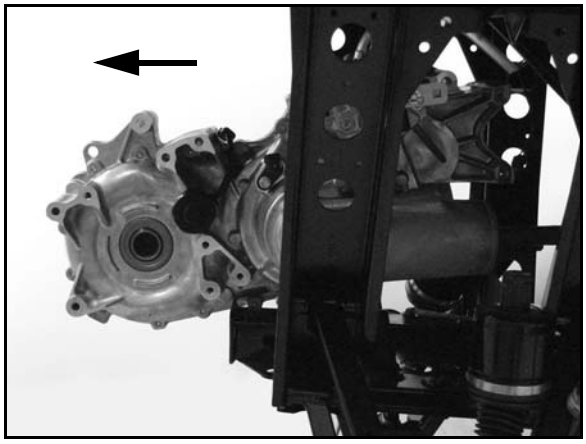
NOTE: The propshaft will slide off during removal.

31. *With the help of an assistant,* lift up on transmission and carefully move it towards the rear of the vehicle.



© Copyright 2011 Polaris Sales Inc.

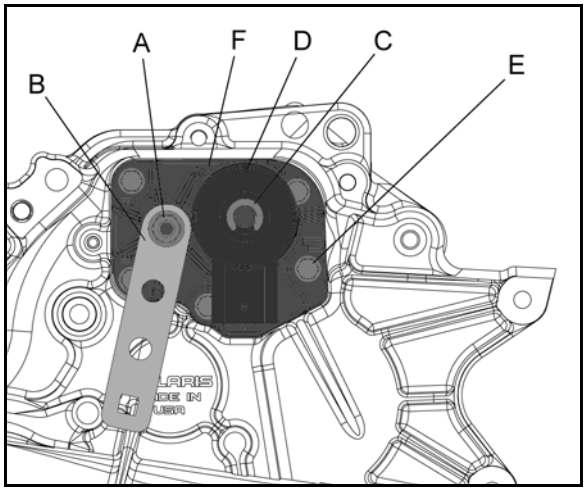
32. Close the cargo box. *With the help of an assistant*, remove the transmission from the rear of the vehicle as shown.



Transmission Disassembly

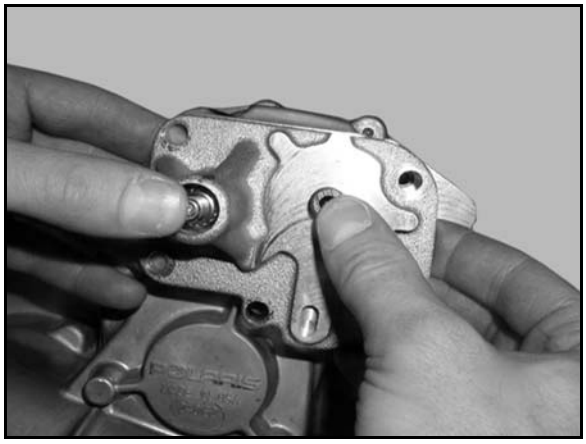
NOTE: Refer to the exploded view at the end of this chapter as a reference.

1. Place the transmission in Reverse before disassembly.
2. Drain and properly dispose of the transmission lubricant (see Chapter 2).
3. Remove the shift cable from the bellcrank (B).
4. Remove the bellcrank nut (A) and bellcrank (B).

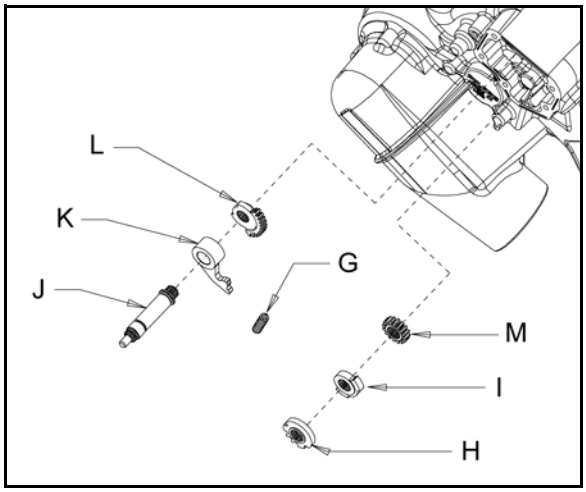


5. Remove the E-clip (C) that retains the gear selector switch (D) and remove the switch.
6. Remove the sector cover bolts (E) and remove the sector cover (F).

NOTE: Removal can be aided by using your thumbs to press down on the shafts while pulling the cover up with your fingers.



7. Remove the compression spring (G).



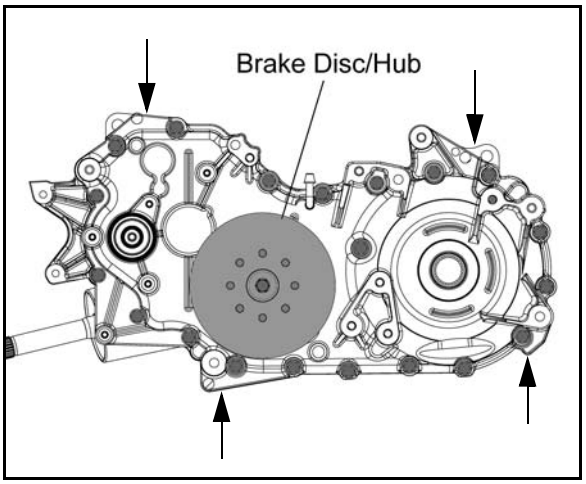
8. Remove the detent star (H). Note how the detent star fits onto the splined shaft with the raised edge facing outward for reassembly.
9. Remove the lockout disc (I). Note the raised edge facing outward for reassembly.
10. Remove the shift shaft (J), detent pawl (K) and the shift gears (L and M).

IMPORTANT: Note the timing marks on the shift gears (L and M) for reassembly purposes.

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

11. Remove the bolt and washer retaining the brake disc assembly to the transmission and remove the disc.

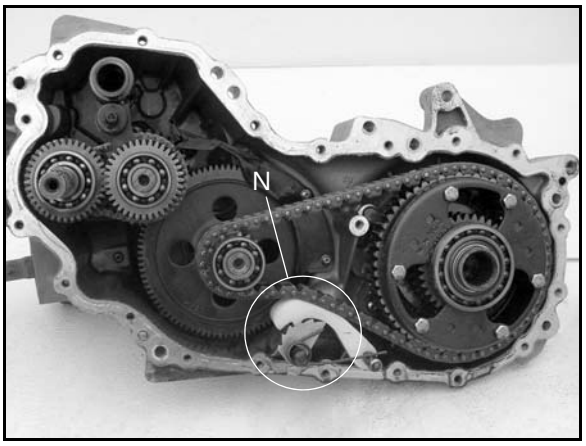
12. Remove all the transmission cover bolts. Using suitable pry bars, remove the cover using the designated pry points (indicated by the black arrows in the illustration below). Tap cover with soft face hammer to remove.



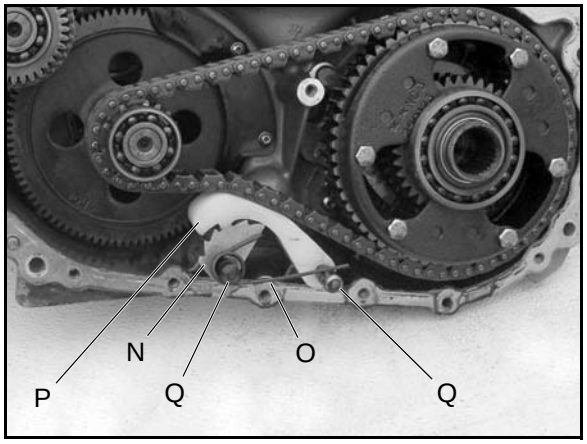
CAUTION

Do not pry on case sealing surfaces. Use only the designated pry points on the transmission.

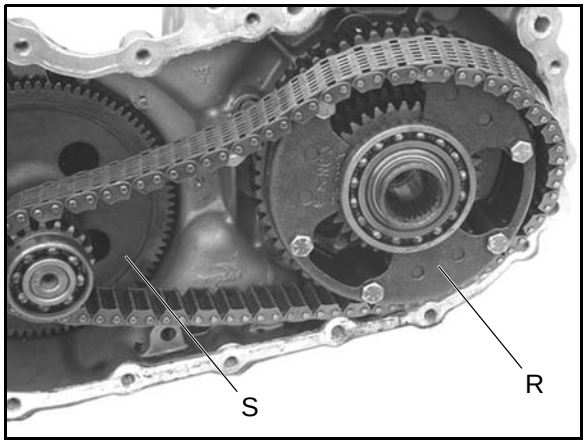
13. Note location of chain tensioner cam (N). If fully extended, chain is worn beyond service limit and should be replaced along with the chain tensioner shoe.



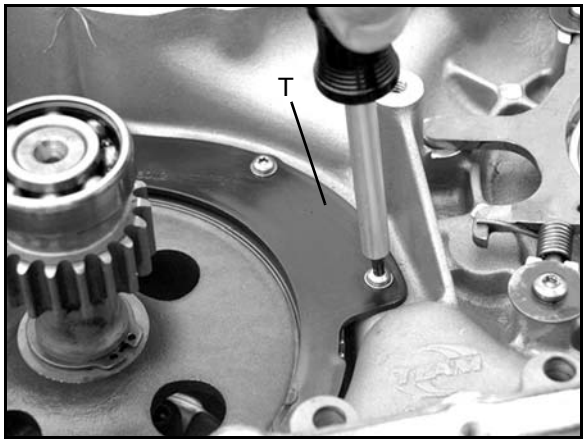
14. Remove the cam chain tensioner spring (O). Slide the cam chain tensioner shoe (P), pins (Q) and cam chain tensioner cam (N) from the assembly.



15. Remove the differential gear (R) and chain by gently prying underneath or tapping the differential gear from the opposite side until it tips toward the output gear (S). The differential gear is connected to the shift fork and must slide backwards to clear the fork arms once the chain is removed.



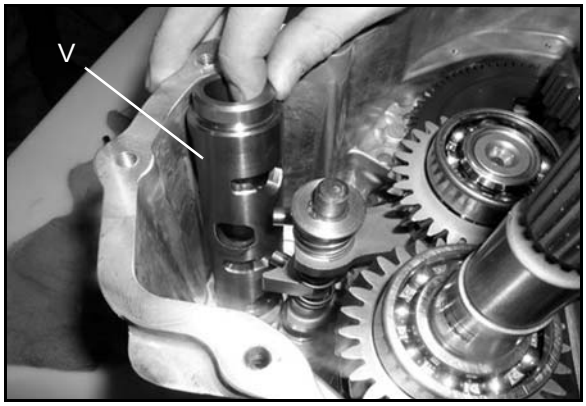
16. Using a T20 Torx driver, remove the screws that secure the oil deflector (T).



9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

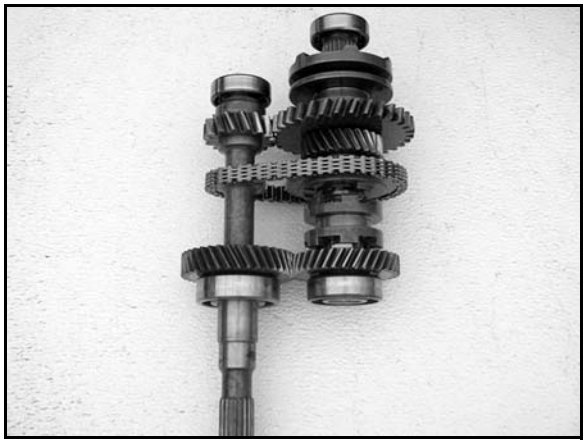
17. Using a T27 Torx driver, remove the screws that secure the output gear (U).

18. Remove the shift drum (V) from the gearcase by moving the drum up and to the right to clear the shift shaft.



19. Remove the output gear (U) and gear cluster assembly from the gearcase by pulling both assemblies straight up.

20. Place the gear cluster assembly on a clean surface for inspection.



Gear Cluster Disassembly

21. Remove the bearing from the reverse shaft using a bearing puller. Slide the engagement dog off of the reverse shaft (see Figure 8-1).

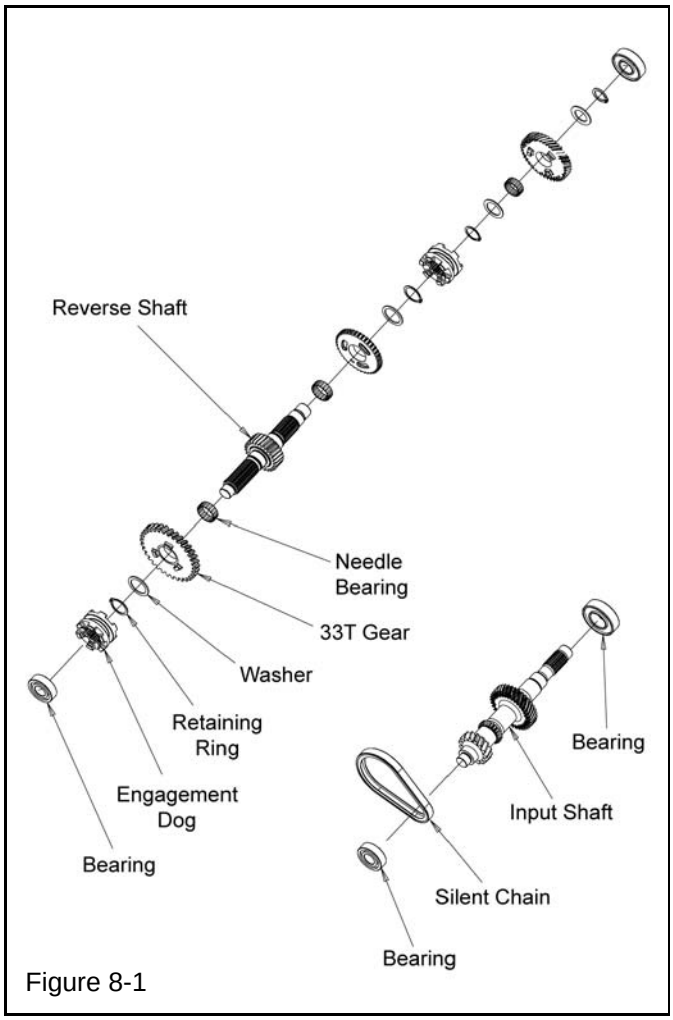
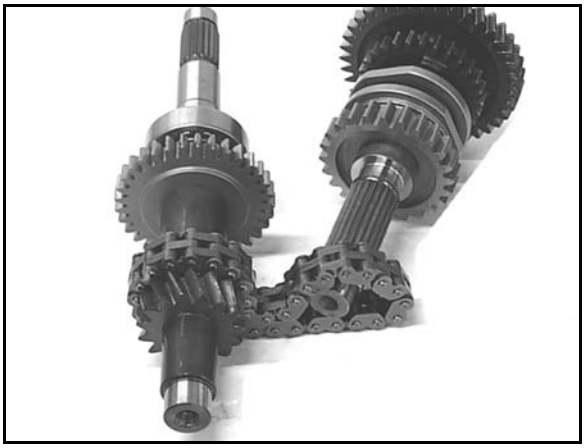


Figure 8-1

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

22. Remove the retaining ring and washer from the reverse shaft (see Figure 8-1).
23. Remove the bearing from the input shaft using a bearing puller (see Figure 8-1).
24. Remove the 33T gear and needle bearing from the reverse shaft (see Figure 8-1).
25. The reverse shaft should slide out of the silent chain to separate the assembly.



26. Remove the rest of the ball bearings from each shaft.
27. Disassemble the other end of the reverse shaft. Remove the retaining ring, washer, gear and needle bearing from the reverse shaft (see Figure 8-2).

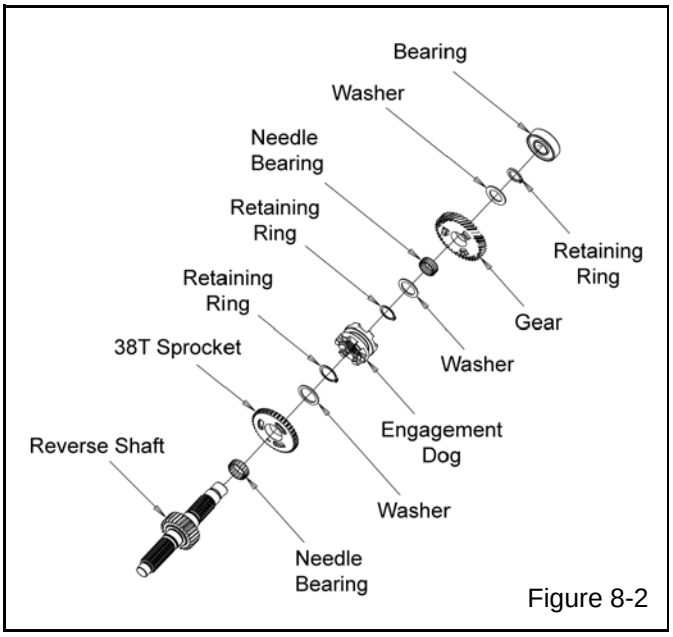
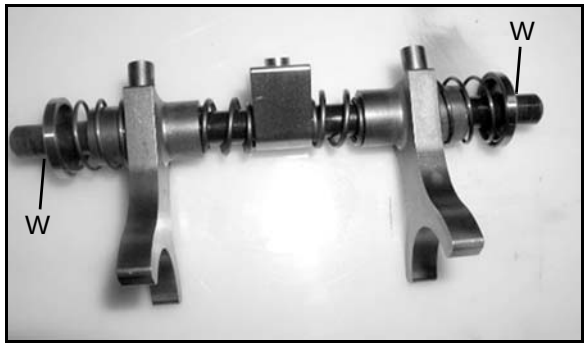


Figure 8-2

28. Remove the washer, retaining ring and engagement dog from the reverse shaft (see Figure 8-2).
29. Remove the retaining ring, washer, 38T sprocket and needle bearing from reverse shaft (see Figure 8-2).
30. To disassemble the shift fork rail remove the snap ring (W) from the end of the shift rail on either side.

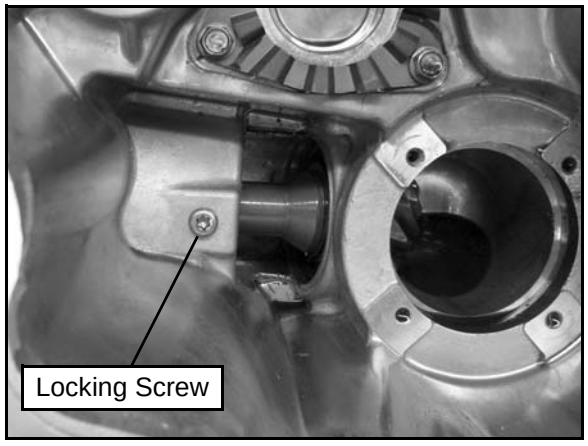


⚠ CAUTION

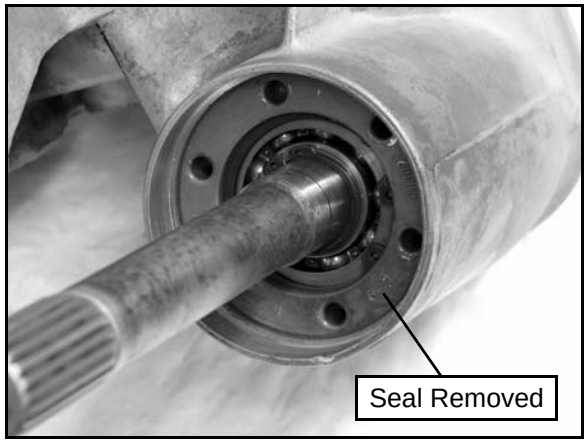
Use caution when disassembling the shift rail. The compressed springs on the shift rail may pop off causing eye or face injury.

Snorkel Shift Removal / Disassembly

31. Using a T27 Torx driver, remove the snorkel tube locking screw located inside the gearcase.

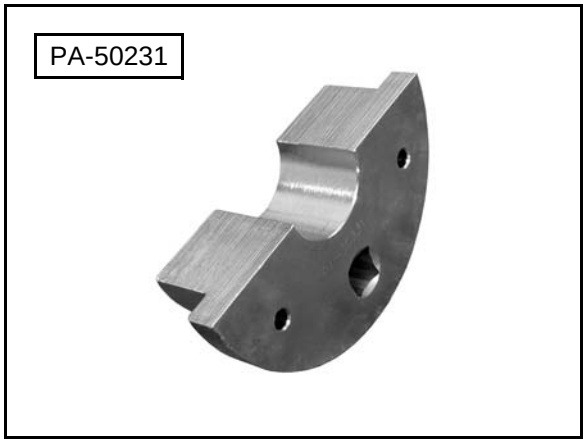


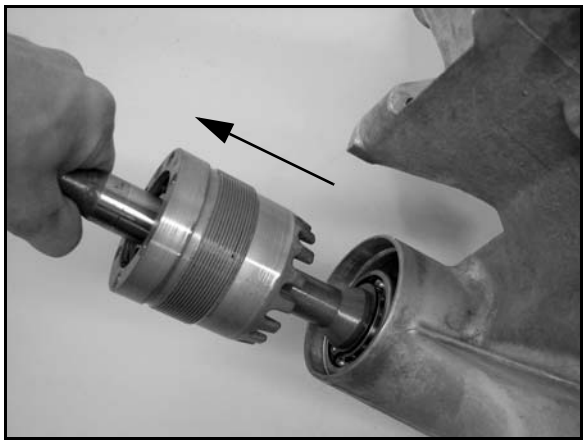
32. Remove the seal from the snorkel shaft to access the snorkel tube for removal.



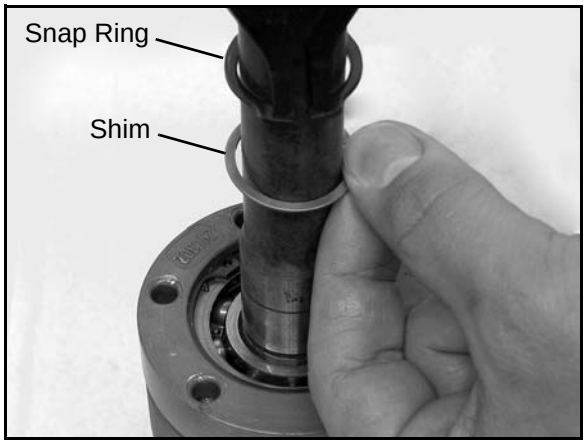
9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

33. Using the Snorkel Tool (PA-50231), loosen and remove the snorkel tube and shaft assembly.



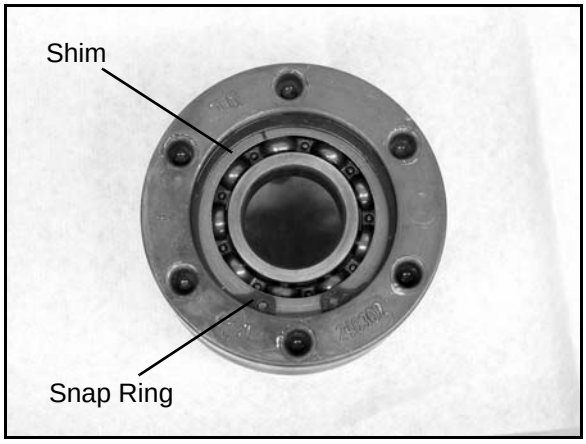


34. Remove the snap ring and shim from the snorkel shaft.

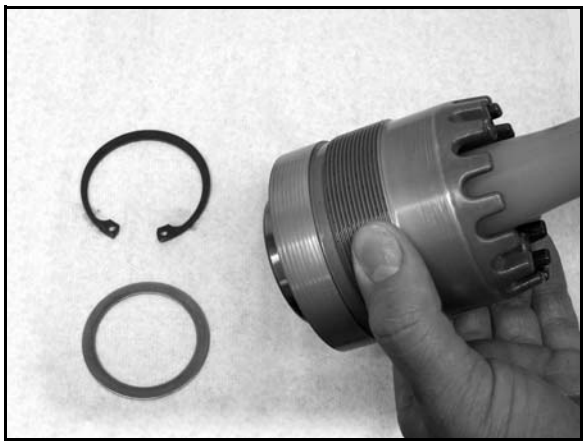


35. Use an arbor press to remove the snorkel tube from the snorkel shaft.

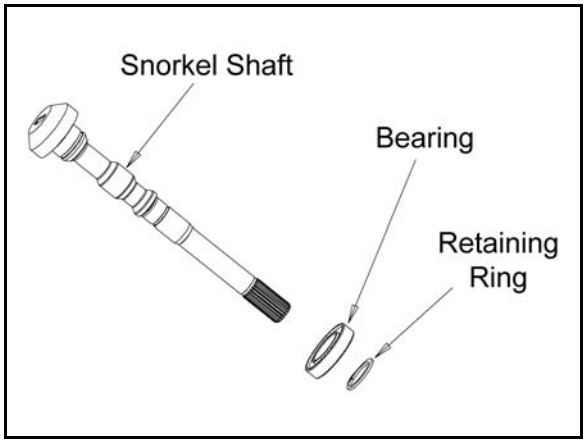
36. Remove the snap ring and shim retaining the bearing in the snorkel tube.



37. Lightly tap on the bearing from the opposite side to remove it from the snorkel tube.



38. To remove the remaining bearing on the snorkel shaft, remove the retaining ring and press the bearing off.

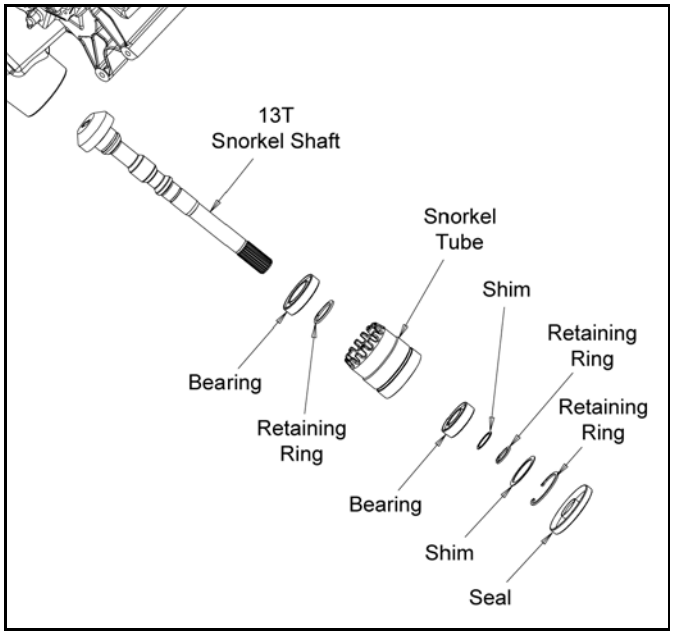


39. Remove all seals from the gearcase halves and clean the cases in preparation for assembly.

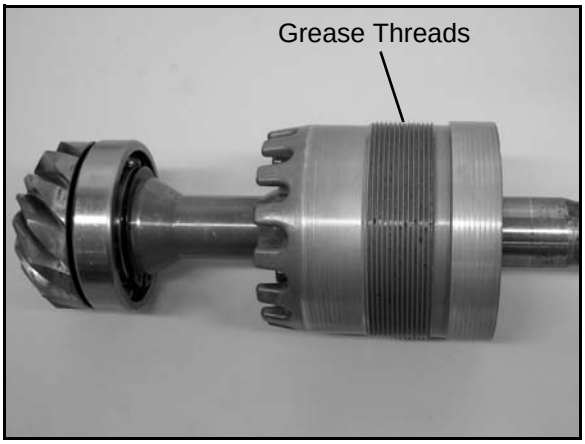
9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

Snorkel / Output Gear Backlash Procedure

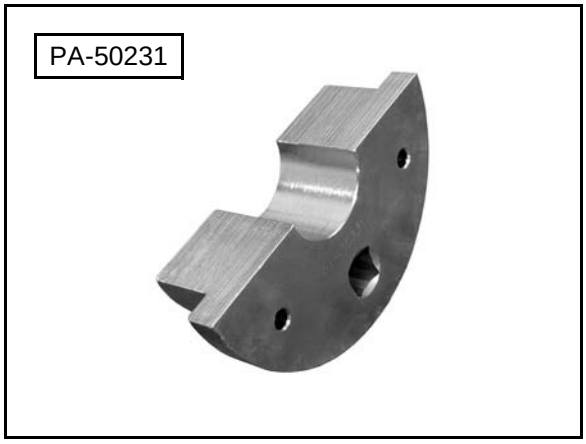
1. Reassemble the snorkel shaft assembly by reversing the disassembly procedure (see “Transmission Snorkel Shaft Removal / Disassembly” in previous section).



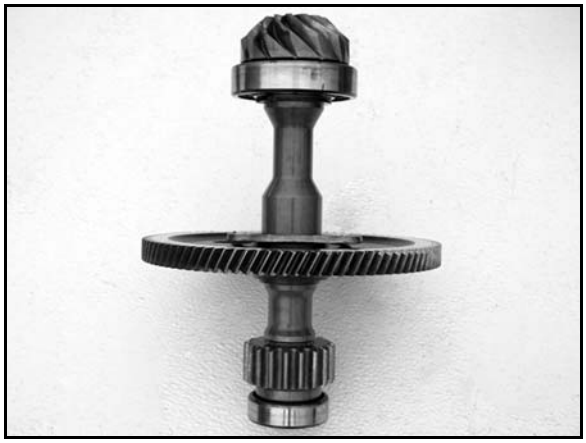
2. Apply a small amount of white lithium grease on the threads of the snorkel tube.



3. Install snorkel shaft into gearcase. Using Snorkel Tool (PA-50231), tighten snorkel tube about 10 full rotations. **Do not completely tighten snorkel tube.**

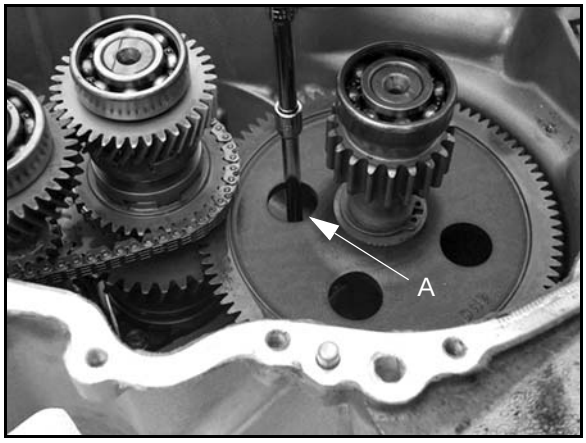


4. Inspect the output gear assembly and replace bearings if needed. Inspect each gear for damage, chips or abnormally worn teeth.



5. Install output gear assembly. Be sure to properly mesh the snorkel shaft bevel gear with output bevel gear.

6. Install the 4 torx screws (A) that secure the output gear assembly. Torque the screws to specification.



9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

= T
Output Gear Retaining Screws: **8-12 ft. lbs. (11-16 Nm)**

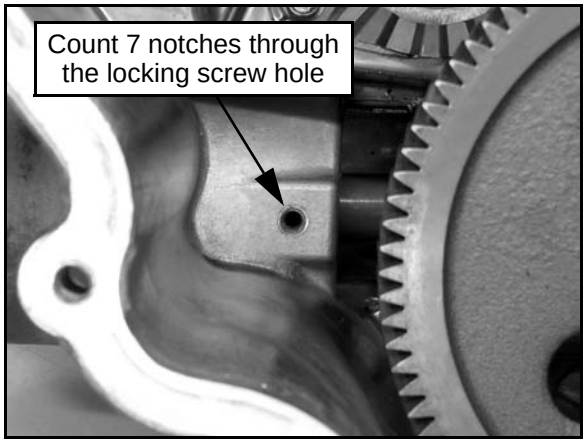
7. Tighten the snorkel tube until it is lightly seated using the snorkel tool (PA-50231). Turn the output shaft to prevent binding while tightening the snorkel tube. Make sure the snorkel shaft gear and output bevel gear have 'zero' lash.

NOTE: It is important to have zero lash between the output gear and the snorkel shaft gear. If there is binding or excess lash, tighten or loosen the snorkel shaft until there is zero lash.

IMPORTANT: Do not overtighten the snorkel tube. Gears should rotate freely without binding.

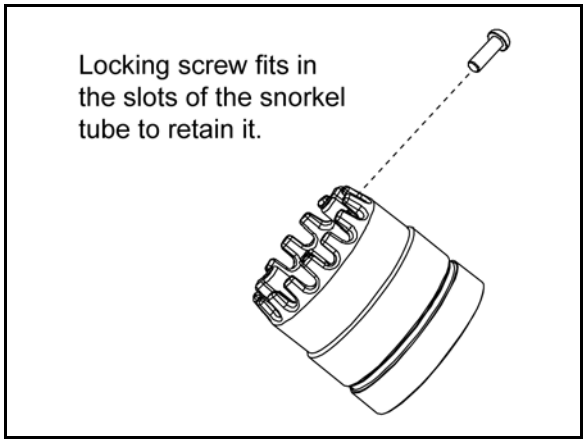
8. Look down into the gearcase at the snorkel locking screw hole opening to reference your starting point.

9. Slowly rotate the snorkel tube counterclockwise while counting the number of notches passing through the hole opening as you rotate the tube. Rotate the snorkel tube to the **7th** notch from the 'seated' position obtained in step 7.

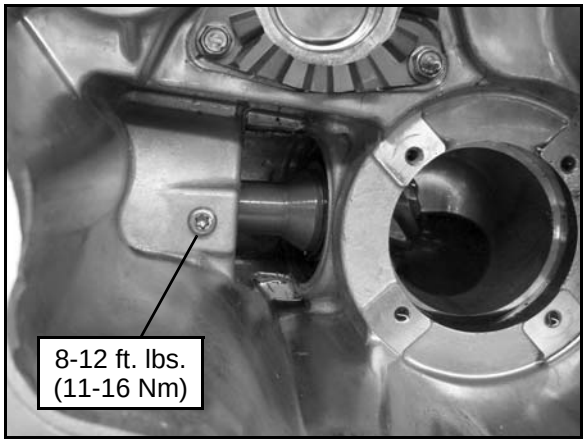


10. Check the output shaft gear backlash again by feel. If the output shaft lash appears to be too tight, rotate the snorkel shaft counterclockwise to the next notch.

11. Once backlash is set, apply Loctite® 242™ to threads and install locking screw to secure the snorkel tube.



12. Torque the locking screw to specification.



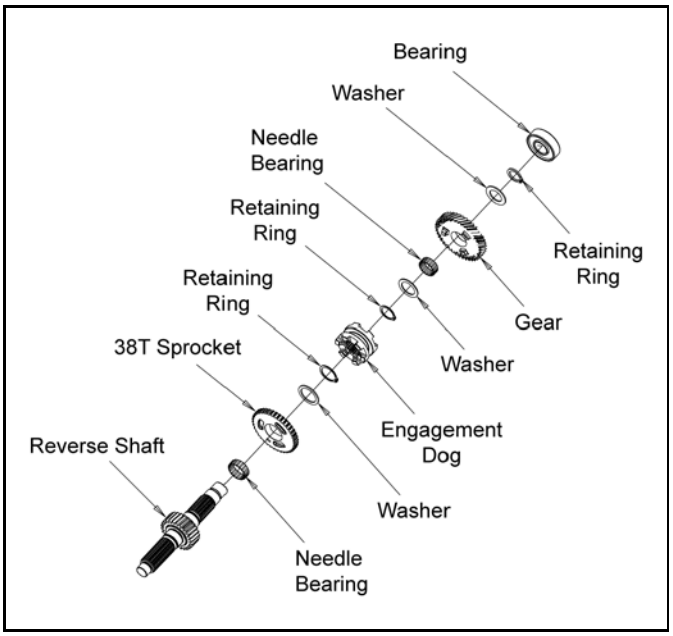
= T
Snorkel Locking Screw: **8-12 ft. lbs. (11-16 Nm)**

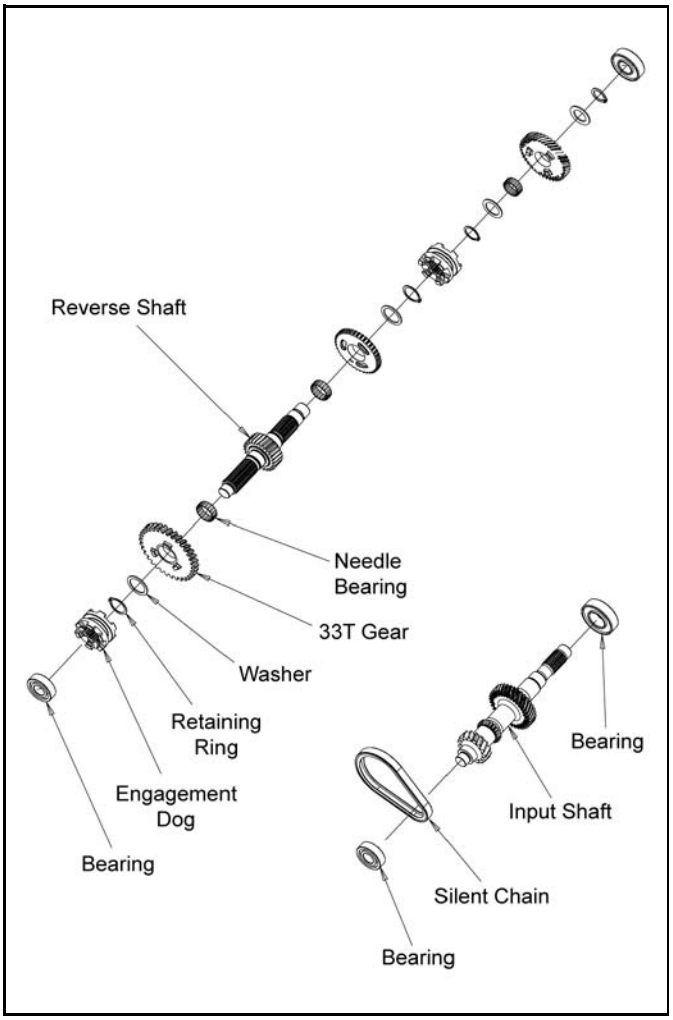
13. With the snorkel shaft properly installed, remove the (4) Torx screws and remove the output shaft.

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

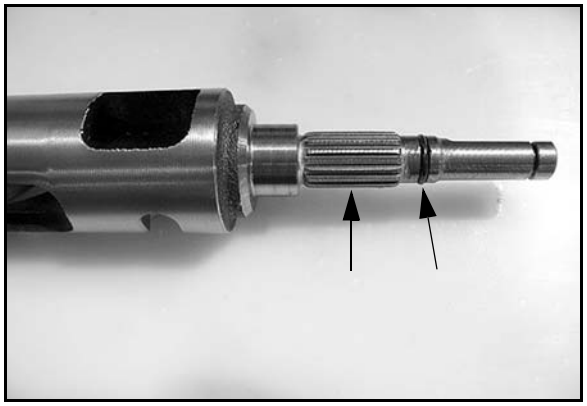
Transmission Assembly

1. Assemble reverse shaft and input shaft if previously disassembled (see illustrations).

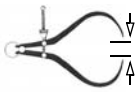




2. Inspect the shift drum for any damage or wear. Inspect the splines of the shift drum. Replace the O-ring on the end of the shift drum and lubricate it before assembly.



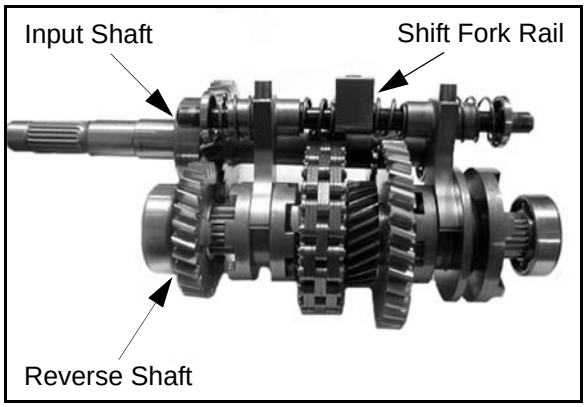
3. Stretch the silent chain on a flat surface and measure the length of 8 pitches in a minimum of three places on the chain. Replace the chain if the measurement is longer than the service limit.



= In. / mm.

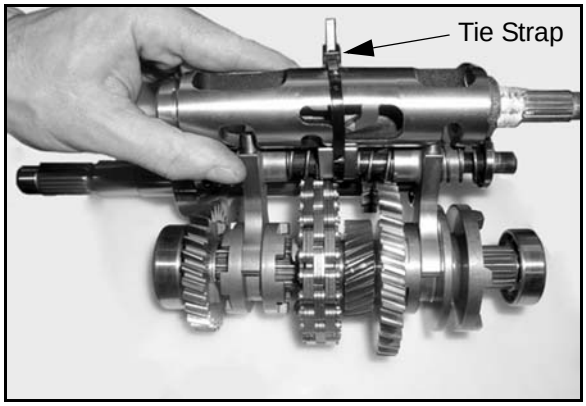
Silent Chain Service Limit (8 pitch):
3.090” (7.849 cm)

4. The shift drum, reverse shaft, input shaft, shift fork rail and output gear assembly must be installed at the same time to properly align all components.

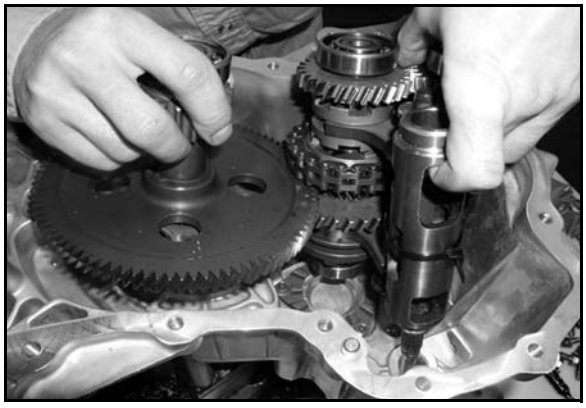


© Copyright 2011 Polaris Sales Inc.

NOTE: To ease assembly use a plastic tie strap to hold the shift forks and the shift drum together during assembly.

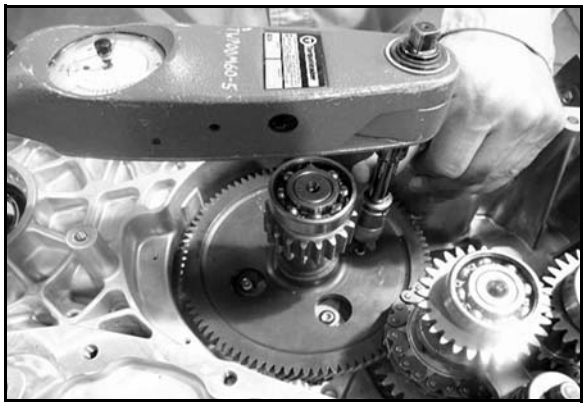


5. With the gearcase on it's side, hold the gear cluster assembly and output assembly together. Carefully install each shaft into their respective recess in the gearcase.



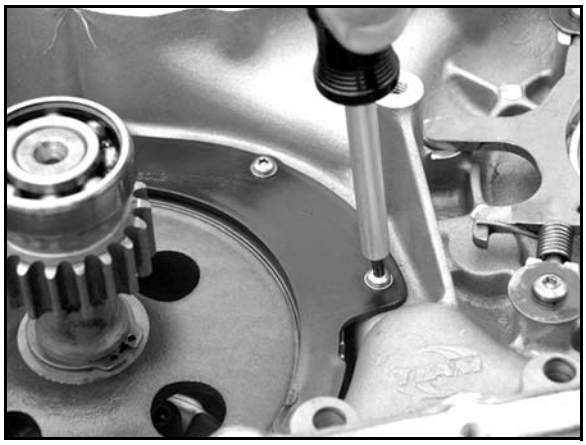
6. With all the components in the correct position, install the (4) output gear assembly retaining screws. Apply Loctite® 242™ to the threads of the screws. Torque the screws to specification.

NOTE: If the transmission is in gear, place the transmission in Neutral.



= T
Output Gear Retaining Screws: **8-12 ft. lbs. (11-16 Nm)**

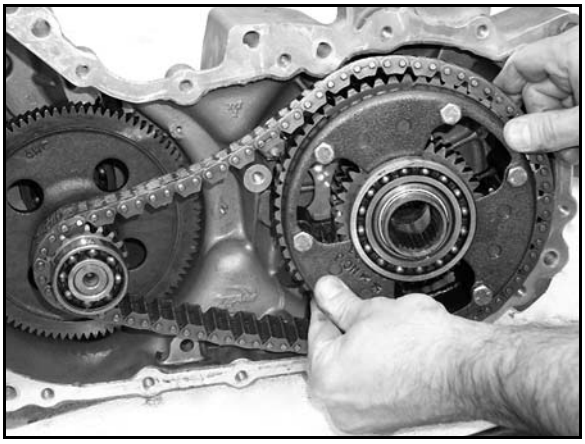
7. Install the oil deflector shield into the gearcase. Apply Loctite® 242™ to the threads of the screws. Torque the screws to specification.



= T
Oil Deflector Retaining Screws: **20-30 in. lbs. (2.3-3.4 Nm)**

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

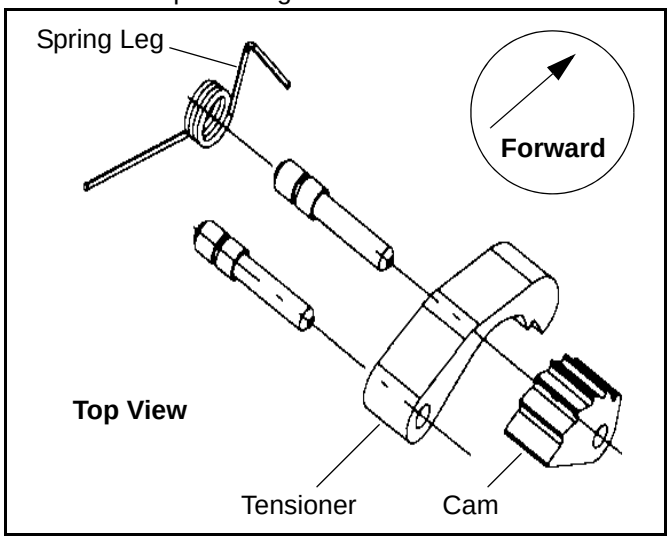
8. Install the rear drive differential and drive chain, following these precautions:
   - The case half rear output seal should be removed prior to differential installation, as seal damage can occur with seal installed due to the angle of entry.
   - Install differential sliding geardog onto the shift fork arms at the same time the silent chain is installed.
   - The differential gear bearing may be lightly tapped into place. The output seal can be installed once the assembly is in place.



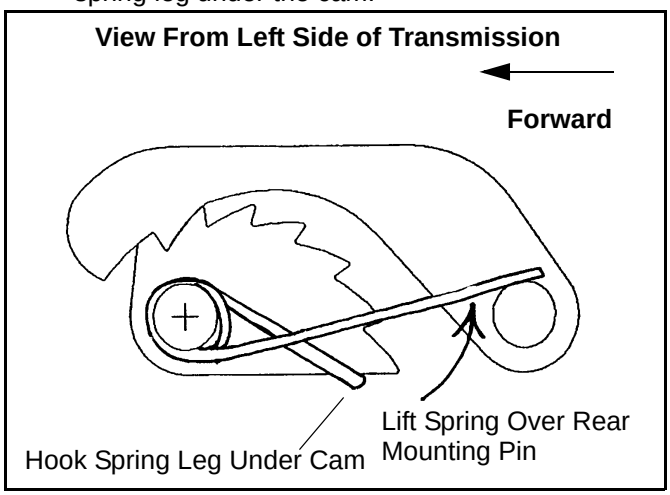
9. Tensioner Installation:

NOTE: Case-halve mating may be difficult due to tensioner pressure on the silent chain during installation. Release tension at the ratcheting cam to aid case half installation. Install the tensioner spring after the case halves are mated but not yet touching.

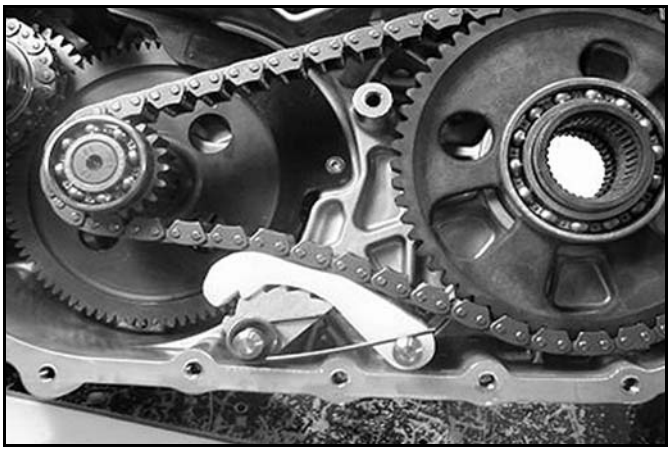
- Assemble the tensioner cam and tensioner shoe and place them into the transmission.
- Insert the front pin through the tensioner cam and the rear pin through the tensioner shoe.



- Place the spring over the front pin and hook the spring leg under the cam.



- Lift the end of the spring up and over the rear pin. The tensioner cam will lift the shoe to provide chain tension.

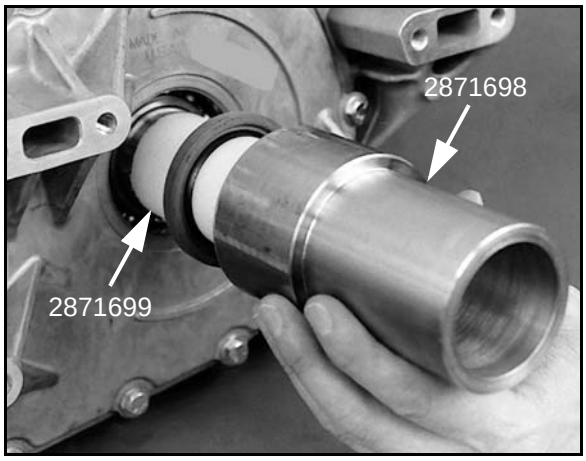


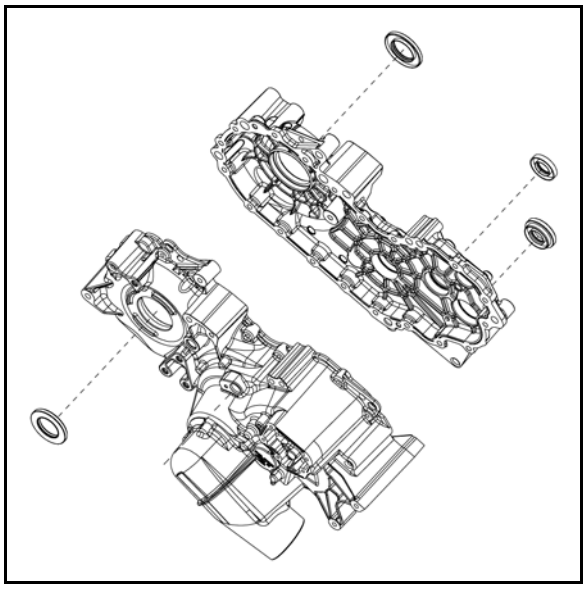
10. Apply a continuous bead of Crankcase 3 Bond Sealant (PN 2871557) to the LH gearcase mating surface and install the cover. Install and tighten the 20 screws in an even criss-cross pattern to evenly secure the cover. Torque the screws to specification.

= T
Gearcase Cover Bolts: **25-30 ft. lbs. (34-41 Nm)**

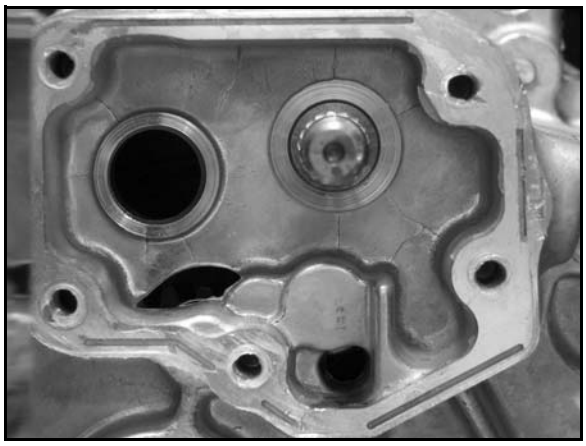
9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

11. Install all new seals into the gearcases. Use the Rear Output Seal Driver (PN 2871698) and Rear Driveshaft Seal Guide (PN 2871699) to install the seals into the gearcase halves (refer to the following illustration to identify the seals needing replacement).

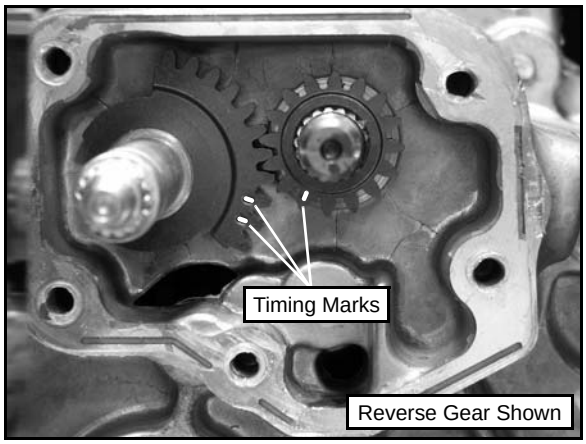




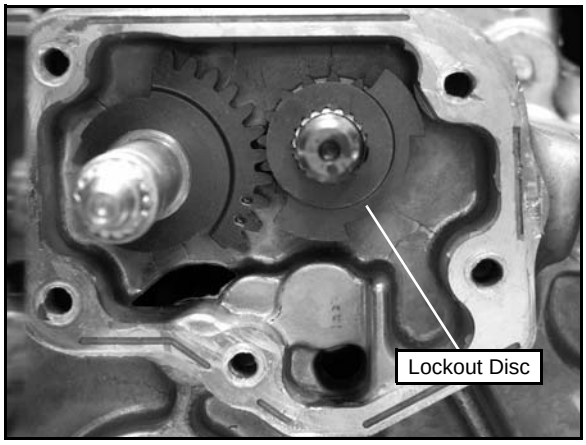
12. Thoroughly clean the shift shaft housing. **Be sure the transmission is in Reverse prior to reassembly.**



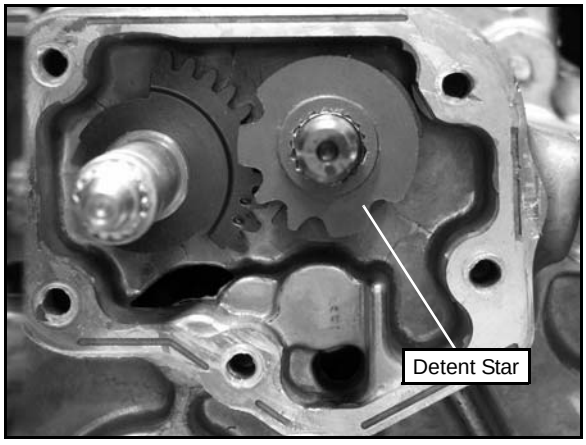
13. Install the sector gear (16T) onto the shift drum shaft. Install the shift shaft assembly and sector gear (11T) into the bushing pocket on the left side. Align the timing marks on the gears as shown.



14. Install the lockout disc onto the shift drum shaft. Be sure to install the lockout disc with the raised edge facing outward.

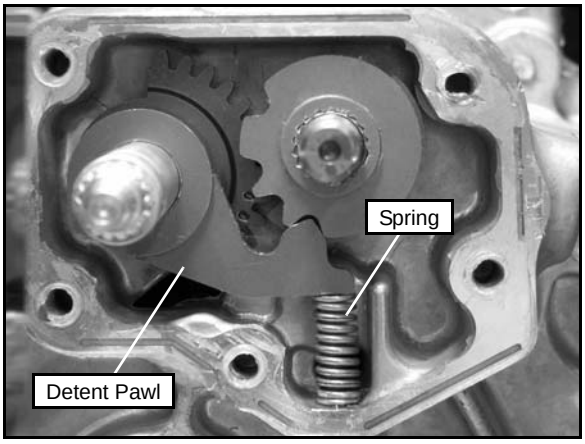


15. Install the detent star onto the shift drum shaft. Be sure to install the detent star with the raised edge facing outward.

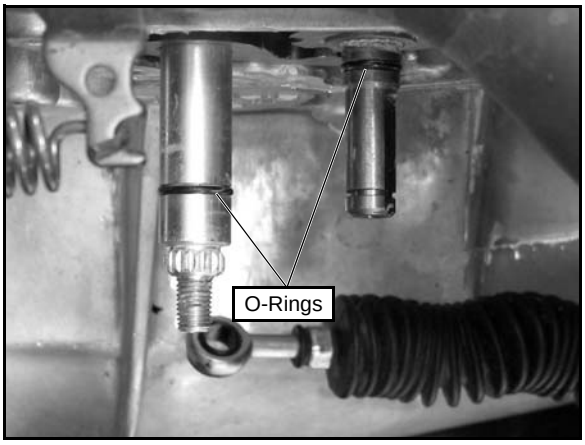


9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

16. Install the detent pawl onto the shift shaft and carefully install the compression spring.



17. Install a new O-ring on each shift shaft. Apply a small amount of white lithium grease on the O-rings, shift shafts and component contact surfaces prior to installing the sector cover.



18. Apply Crankcase Sealant (3-Bond) (PN 2871557) onto the cover and transmission case mating surface. Install the sector cover and torque the bolts to specification.

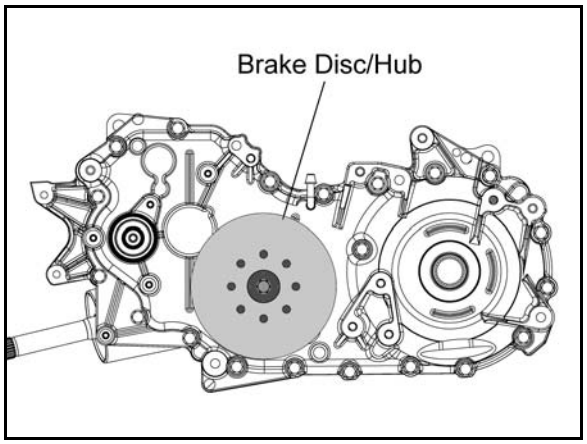
= T
Sector Cover Bolts: **8-12 ft. lbs. (11-16 Nm)**

19. Install the bellcrank onto the shift shaft. **Note the key splined on the bellcrank and shift shaft.** Install the nut and torque to specification.

= T
Bellcrank Nut: **12-18 ft. lbs. (16-24 Nm)**

20. Install the transmission gear selector switch and secure the switch with the retaining ring.

21. Install the brake disc assembly onto the output shaft. Apply Loctite® 262™ or 2760™ to the mounting bolt threads and torque the bolt to specification.



= T
Park Brake Disc Mounting Bolt: **10-15 ft. lbs. (14-20 Nm)**

© Copyright 2011 Polaris Sales Inc.

Transmission Installation

1. If transmission lubricant was drained, fill the transmission with the specified amount of Polaris AGL Plus prior to installation.

=
Recommended Transmission Lubricant: AGL Plus (PN 2878068) (Quart) **Capacity:** 33.8 oz. (1000 ml)

2. Apply Polaris Premium All Season Grease (PN 2871423) to splines of front output shaft.

3. *With the help of an assistant*, position the transmission into the frame from the rear of the vehicle. Align the output shaft and propshaft splines while positioning the transmission to allow the shafts to slide together.

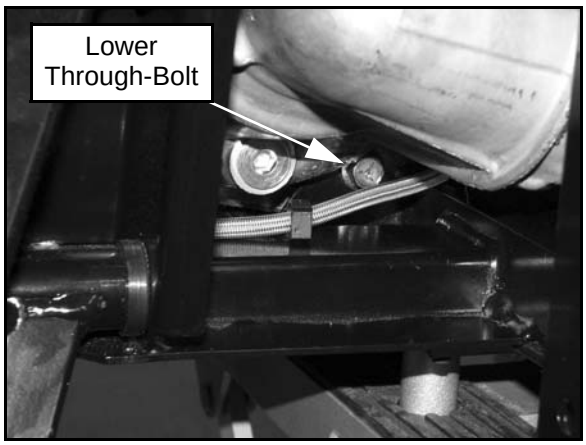
4. Install the engine-to-transmission mount bracket.

5. Install the (2) rubber engine mounts into the engine crankcase.

6. Position the engine-to-transmission mount bracket and install the (2) through-bolts and (2) lower engine mount nuts loosely.

7. Install the lower and rear transmission through-bolts.

IMPORTANT: Be sure the brake line is clear of the lower through-bolt upon installation.



8. Torque all transmission mount fasteners to specification.

= T
Transmission Mounting Fastener Torque: Front 5/16” Bolts: **20 ft. lbs. (27 Nm)** Lower / Rear 3/8” Bolts: **37 ft. lbs. (50 Nm)**

9. Install the parking brake caliper assembly and torque the mount bracket fasteners to specification.

= T
Parking Brake Caliper to Mount Bracket: **18 ft. lbs. (24 Nm)** Mount Bracket to Transmission: **40 ft. lbs. (54 Nm)**

10. Connect electrical harnesses to the rear diff solenoid, gear selector switch and vehicle speed sensor.

11. Remove the tie straps retaining each drive shaft and the one retaining the exhaust pipe to the airbox. Reinstall the air filter and airbox lid.

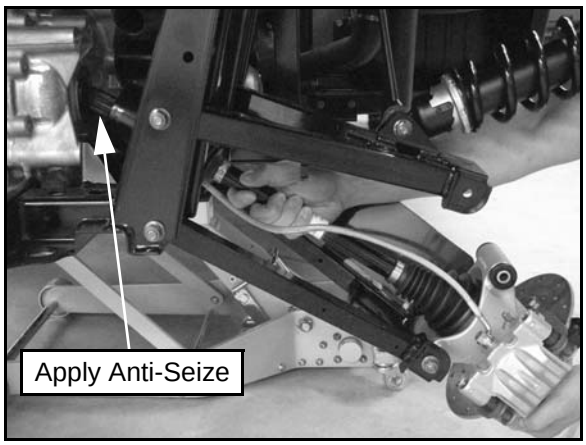
12. Properly route the transmission vent line. Be sure vent line is not kinked or pinched.

13. Install the rear cargo box shock.

14. Install the stabilizer bar to the frame and to each stabilizer linkage. Torque fasteners to specification.

= T
Stabilizer Bar Retaining Bolts: Stabilizer Linkage Rubber Bushing Nuts: **17 ft. lbs. (24 Nm)**

15. Apply anti-seize to the splines of each rear drive shaft and insert them into the transmission.



9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

16. Attach the rear upper A-arms to the bearing carrier on each side and torque the fasteners to specification.

= T
Rear Upper A-Arm to Bearing Carrier Bolts: **30 ft. lbs. (41 Nm)**

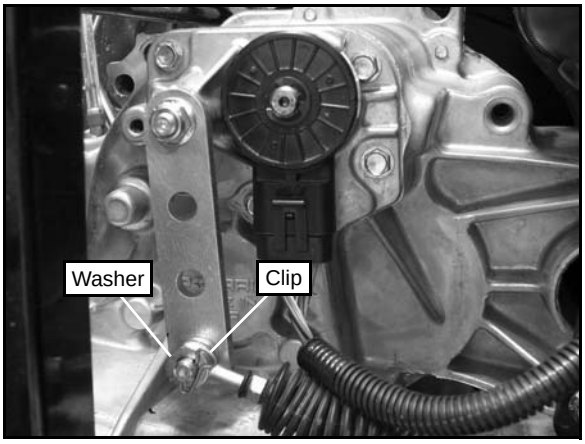
17. Place the rear brake line into the retainer located on each rear upper A-arm.

18. Attach the rear shocks to the frame and torque the upper fasteners to specification.

= T
Rear Upper Shock Bolts: **30 ft. lbs. (41 Nm)**

19. Install the shift cable onto the mount bracket.

20. Install the shift cable onto the transmission bell crank end and secure with the outer washer and clip.



21. If both adjustment jam nuts were moved, adjust the shift cable (see “Shift Cable - Adjustment”).

22. Install the exhaust silencer and (2) retaining springs.

23. Install the inner PVT cover and torque the (8) screws to specification (see Chapter 6).

24. Install the drive clutch, driven clutch and drive belt. Torque the clutch retaining bolts to specification (see Chapter 6).

NOTE: Align clutches as outlined in Chapter 6.

25. Install the outer PVT cover and (9) screws. Torque the screws to specification (see Chapter 6).

26. Install the brake switch harness below the outer PVT cover.

27. Install the rear wheels, washers and wheel nuts. Torque the wheel nuts to specification.

= T
Wheel Nuts: **Steel Wheels: 35 ft. lbs. (47 Nm)** **Aluminum Wheels: 30 ft. lbs. (41 Nm) + 90°**

28. Carefully lower the vehicle to the ground and reinstall the side storage container and seat.

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

TROUBLESHOOTING

Troubleshooting Checklist

Check the following items when shifting difficulty is encountered.

- Shift cable adjustment/condition
- Idle speed (throttle cable routing)
- PVT clutch alignment
- Transmission lubricant type/quality
- Drive belt deflection (where applicable)
- Loose fasteners on sector gear cover
- Worn rod ends, clevis pins, or pivot arm bushings
- Shift selector rail travel
- Worn, broken or damaged internal transmission components

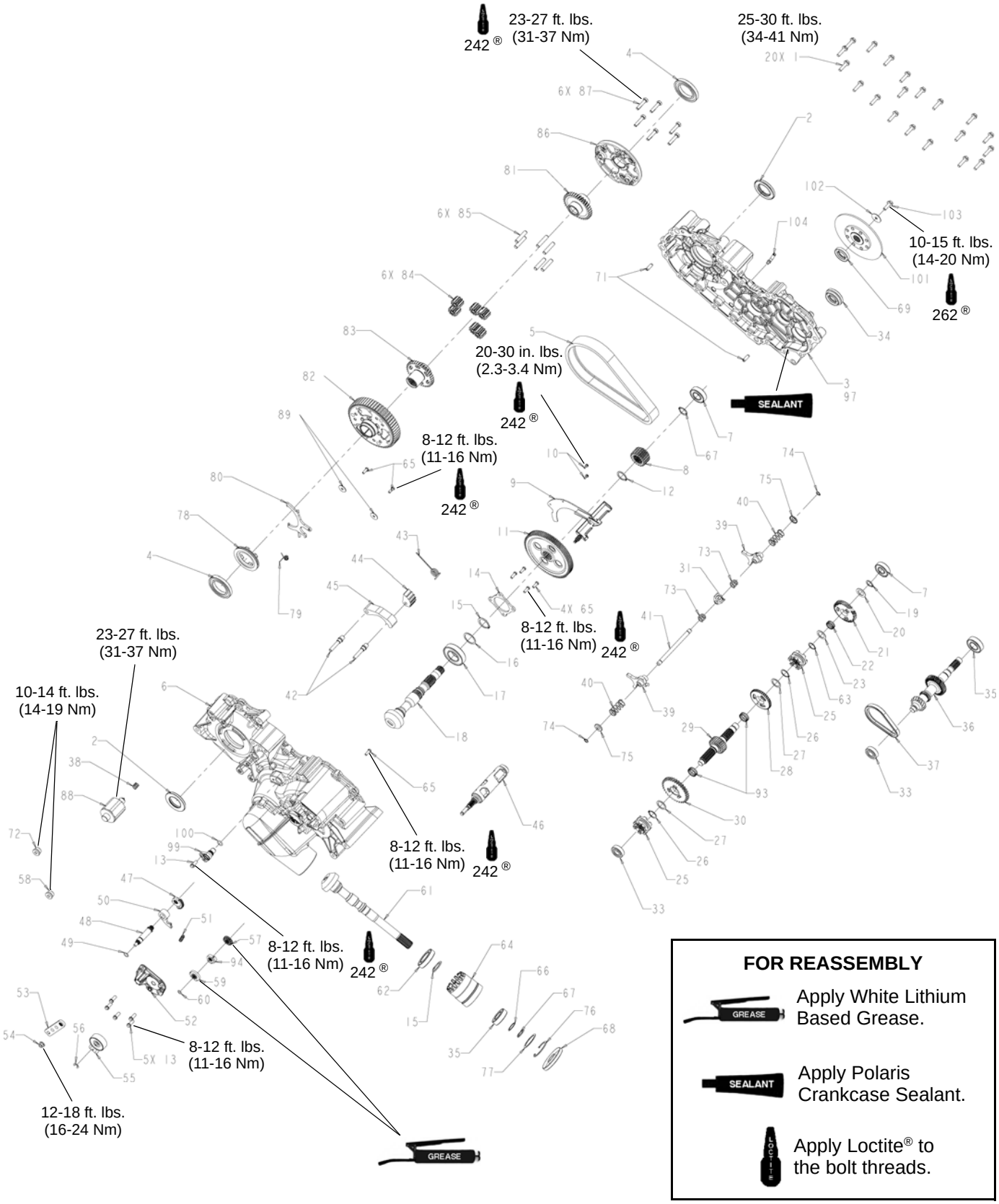
NOTE: To determine if shifting difficulty or problem is caused by an internal transmission problem, isolate the transmission by disconnecting the shift cable end from the transmission bellcrank. Manually select each gear range at the transmission bellcrank, and test ride vehicle. If it functions properly, the problem is outside the transmission.

If transmission problem remains, disassemble transmission and inspect all gear dogs for wear (rounding) or damage. Inspect all bearings, circlips, thrust washers and shafts for wear.

© Copyright 2011 Polaris Sales Inc.

TRANSMISSION EXPLODED VIEW (2011)

RANGER XP/HD 800 (PN 1332898); *RANGER* CREW 800 (PN 1332872)



© Copyright 2011 Polaris Sales Inc.

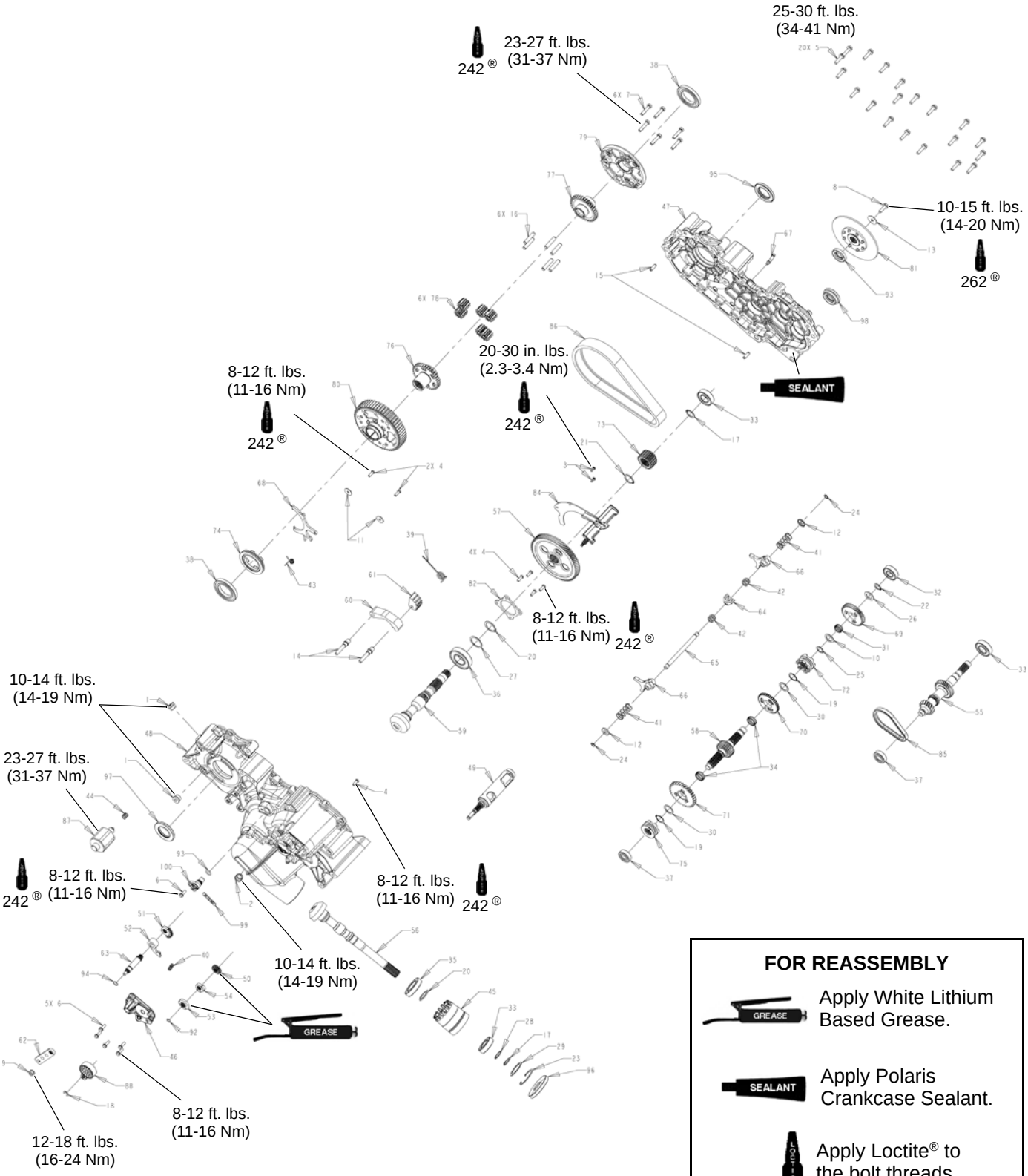
Exploded View, Continued

Ref.	Qty.	Description	Ref.	Qty.	Description
1.	20	Screw, Self Tapping Hex	50.	1	Detent Pawl
2.	2	Seal, Triple Lip	51.	1	Compression Spring, Detent
3.	1	Cover, LH	52.	1	Cover, Sector
4.	2	Bearing, Ball	53.	1	Bellcrank, Shift Drum
5.	1	Silent Chain	54.	1	Lock Nut
6.	1	Case, RH	55.	1	Rotary Switch, 6-Pin
7.	1	Bearing, Ball	56.	1	Retaining Ring
8.	1	Sprocket, 19T	57.	1	Gear, Sector 16T
9.	1	Oil Deflector	58.	1	Drain Plug, Magnetic
10.	2	Screw, Self Tapping Torx	59.	1	Detent Star
11.	1	Output Gear, 91T	60.	1	O-Ring
12.	1	Retaining Ring	61.	1	Gear, 13T Snorkel
13.	6	Screw, Self Tapping Hex	62.	1	Bearing, Ball
14.	1	Bearing Cover, Center Drive	63.	1	Retaining Ring
15.	2	Retaining Ring	64.	1	Snorkel Tube
16.	1	Shim	65.	7	Screw, Torx
17.	1	Bearing, Ball	66.	1	Shim
18.	1	Pinion, 13T Center Drive	67.	2	Retaining Ring
19.	1	Retaining Ring	68.	1	Seal, Triple Lip
20.	1	Thrust Washer	69.	1	Seal, Triple Lip
21.	1	Gear, 36T Spur (XP/HD); Gear, 41T Spur (CREW)	71.	2	Dowel Pin
22.	1	Bearing, Needle	72.	1	Fill Plug
23.	1	Washer	73.	2	Compression Spring
25.	2	Engagement Dog, 6-Face	74.	2	Retaining Ring
26.	2	Retaining Ring	75.	2	Washer, Cup
27.	2	Thrust Washer	76.	1	Retaining Ring
28.	1	Sprocket, 38T 6-Face	77.	1	Shim
29.	1	Reverse Shaft, 26T	78.	1	Engagement Dog
30.	1	Gear, 33T 6-Face	79.	1	Torsion Spring
31.	1	Shift Collar	80.	1	Fork, Pivot Shift, Rear Diff
33.	2	Bearing, Ball	81.	1	Side Gear, 36T
34.	1	Seal, Triple Lip	82.	1	Carrier Assembly
35.	3	Bearing, Ball	83.	1	Side Gear, 36T, Disconnect
36.	1	Input Shaft, 35T (XP/HD); Input Shaft, 31T (CREW)	84.	6	Gear Assembly
37.	1	Silent Chain	85.	6	Dowel Pin
38.	1	Compression Spring	86.	1	Cover
39.	2	Shift Fork	87.	6	Screw
40.	2	Compression Spring	88.	1	Solenoid
41.	1	Rail, Shift Shaft	89.	2	Washer, Fender
42.	2	Pin	93.	2	Bearing, Needle
43.	1	Torsion Spring	94.	1	Lockout Disc
44.	1	Cam, Chain Tensioner	99	1	Vehicle Speed Sensor
45.	1	Shoe, Chain Tensioner	100.	1	O-Ring
46.	1	Shift Drum	101.	1	Brake Disc/Hub Assembly
47.	1	Gear, Sector 31T	102.	1	Washer, Fender
48.	1	Shift Shaft	103.	1	Screw
49.	1	O-Ring	104.	1	Vent Tube

9923499 - 2011 / 2012 *RANGER* 800 Service Manual
© Copyright 2011 Polaris Sales Inc.

TRANSMISSION EXPLODED VIEW (2012)

RANGER XP/HD 800 (PN 1332961); *RANGER* CREW 800 (PN 1332977)



FOR REASSEMBLY

GREASE — Apply White Lithium Based Grease.

SEALANT — Apply Polaris Crankcase Sealant.

LOCTITE — Apply Loctite® to the bolt threads.

© Copyright 2011 Polaris Sales Inc.

Exploded View, Continued

Ref.	Qty.	Description	Ref.	Qty.	Description
1.	2	Fill Plug	49.	1	Shift Drum
2.	1	Drain Plug, Magnetic	50.	1	Gear, Sector 16T
3.	2	Screw, Self Tapping Torx	51.	1	Gear, Sector 31T
4.	7	Screw, Torx	52.	1	Detent Pawl
5.	20	Screw, Self Tapping Hex	53.	1	Detent Star
6.	6	Screw, Self Tapping Hex	54.	1	Lockout Disc
7.	6	Screw	55.	1	Input Shaft, 31T (CREW); Input Shaft, 35T (XP/HD)
8.	1	Screw	56.	1	Gear, Snorkel, 13T
9.	1	Lock Nut	57.	1	Gear, Output, 91T
10.	1	Washer	58.	1	Reverse Shaft, 26T
11.	2	Washer, Fender	59.	1	Pinion, Center Drive, 13T
12.	2	Washer, Cup	60.	1	Shoe, Chain Tensioner
13.	1	Washer, Fender	61.	1	Cam, Chain Tensioner
14.	2	Pin	62.	1	Bellcrank, Shift Drum
15.	2	Dowel Pin	63.	1	Shift Shaft
16.	6	Dowel Pin	64.	1	Shift Collar
17.	2	Retaining Ring, External	65.	1	Rail, Shift Shaft
18.	1	Snap Ring	66.	2	Shift Fork
19.	2	Retaining Ring	67.	1	Vent Tube
20.	2	Retaining Ring	68.	1	Fork, Pivot Shift, Rear Diff
21.	1	Retaining Ring	69.	1	Gear, 41T (CREW); Gear, 36T (XP/HD)
22.	1	Retaining Ring, External	70.	1	Sprocket, 38T, 6-Face
23.	1	Retaining Ring, Internal	71.	1	Gear, 33T, 6-Face
24.	2	Retaining Ring, External	72.	1	Engagement Dog, 6-Face
25.	1	Retaining Ring, External	73.	1	Sprocket, 19T
26.	1	Thrust Washer	74.	1	Engagement Dog
27.	1	Shim	75.	1	Engagement Dog, Low, 6-Face
28.	1	Shim	76.	1	Side Gear, 36T, Disconnect
29.	1	Shim	77.	1	Side Gear, 36T
30.	2	Thrust Washer	78.	6	Planet Gear Assembly
31.	1	Bearing, Needle	79.	1	Cover
32.	1	Bearing, Ball	80.	1	Carrier Assembly
33.	3	Bearing, Ball	81.	1	Brake Disc/Hub Assembly
34.	2	Bearing, Needle	82.	1	Bearing Cover, Center Drive
35.	1	Bearing, Ball	84.	1	Oil Deflector
36.	1	Bearing, Ball	85.	1	Chain
37.	2	Bearing, Ball	86.	1	Silent Chain
38.	2	Bearing, Ball	87.	1	Solenoid
39.	1	Torsion Spring	88.	1	Rotary Switch, 2-Pin
40.	1	Compression Spring	92.	1	O-Ring
41.	2	Compression Spring	93.	1	O-Ring
42.	2	Compression Spring	94.	1	O-Ring
43.	1	Torsion Spring	95.	1	Seal, Triple Lip
44.	1	Compression Spring	96.	1	Seal, Triple Lip
45.	1	Snorkel Tube	97.	2	Seal, Triple Lip
46.	1	Cover, Sector	98.	1	Seal, Dual Lip
47.	1	Cover, LH	100.	1	Speed Sensor
48.	1	Case, RH			

© Copyright 2011 Polaris Sales Inc.

NOTES

© Copyright 2011 Polaris Sales Inc.